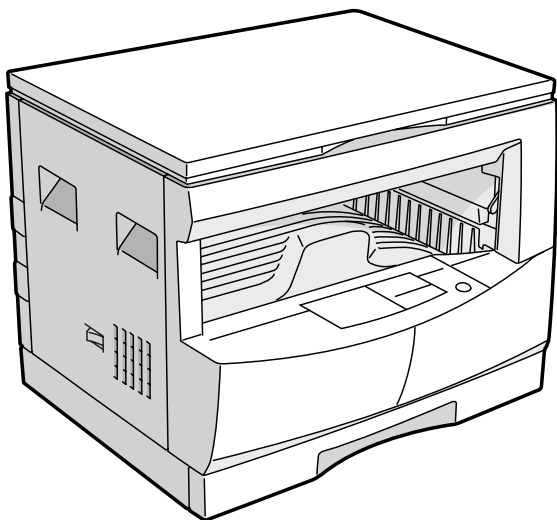


SHARP SERVICE MANUAL

CODE: 00ZAL1610//A1E



DIGITAL COPIER

AL-1600 MODEL AL-1610

CONTENTS

[1] GENERAL	1-1
[2] SPECIFICATIONS	2-1
[3] CONSUMABLE PARTS	3-1
[4] EXTERNAL VIEWS AND INTERNAL STRUCTURE	4-1
[5] UNPACKING AND INSTALLATION	5-1
[6] OPERATIONAL DESCRIPTIONS	6-1
[7] ADJUSTMENTS	7-1
[8] SIMULATIONS	8-1
[9] USER PROGRAM	9-1
[10] TROUBLE CODE LIST	10-1
[11] DISASSEMBLY AND ASSEMBLY	11-1
[12] ELECTRICAL SECTION	12-1
[13] CIRCUIT DIAGRAM	13-1
[14] ACTUAL WIRING DIAGRAM	14-1

Parts marked with "△" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

Warning!

This product is a class A product.

If it is operated in households, offices or similar surroundings, it can produce radio interferences at other appliances, so that the user has to take adequate countermeasures.

CLASS 1 LASER PRODUCT

LASER KLASSE 1

LUOKAN 1 LASERLAITE

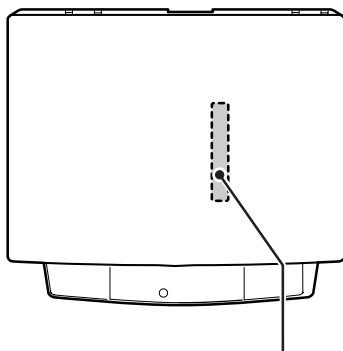
KLASS 1 LASERAPPARAT

VAROITUS!

LAITTEEN KÄYTTÄMINEN
MUULLA KUIN TÄSSÄ
KÄYTTÖOHJEESSA MAINITULLA
TAVALLA SAATTAA ALTISTAA
KÄYTTÄJÄN
TURVALLISUUSLUOKAN 1
YLITTÄVÄLLE
NÄKYMÄTTÖMÄLLE
LASERSÄTEILYLLE.

VARNING

OM APPARATEN ANVÄNDS PÅ
ANNAT SÄTT ÄN I DENNA
BRUKSANVISNING
SPECIFICERATS, KAN
ANVÄNDAREN UTSÄTTAS FÖR
OSYNLIG LASERSTRÅLNING,
SOM ÖVERSKRIDER GRÄNSEN
FÖR LASERKLASS 1.



Laserstrahl

CAUTION

INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED.

AVOID EXPOSURE TO BEAM.

VORSICHT

UNSICHTBARE LASERSTRAHLUNG WEHN ABDECKUNG GEÖFFNET UND

SICHERHEITSVERREGELUNG ÜBERÜCKT. NICHT DEM STRAHL AUSSETZEN.

ADVARSEL

USYNLIG LASERSTRÅLNING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER

UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.

ADVERSEL

USYNLIG LASERSTRÅLNING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES.

UNNGÅ EKSPONERING FOR STRÅLEN.

VARNING

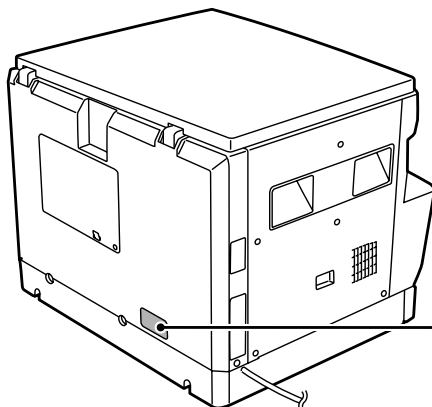
OSYNLIG LASERSTRÅLNING NÅR DENNA DEL ÄR ÖPPNAD OCH SPÄRRAR ÄR

URKOPPLADE. STRÅLEN ÄR FARLIG. BETRÄKTA EJ STRÅLEN.

VARO!

AVATTAESSA JA SUOJALUKITUS OHTETTAESSA OLET ALLTTINA NÄKYMÄTÖNTÄ

LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.



**CLASS 1
LASER PRODUCT**
LASER KLASSE 1

CONTENTS

[1] GENERAL	1-1	[9] USER PROGRAM	9-1
1. General	1-1	1. User program functions	9-1
2. Target user copy volume: Monthly average ...	1-1	2. Setting change procedure	9-1
3. Main features	1-1	[10] TROUBLE CODE LIST	10-1
4. Copier installation	1-1	[11] DISASSEMBLY AND ASSEMBLY	11-1
[2] SPECIFICATIONS	2-1	1. High voltage section	11-1
1. Copy mode	2-1	2. Optical section	11-1
[3] CONSUMABLE PARTS	3-1	3. Fusing section	11-2
1. Supply system table	3-1	4. Paper exit section	11-4
2. Environment conditions	3-2	5. MCU	11-6
3. Production number identification	3-2	6. Optical frame unit	11-6
[4] EXTERNAL VIEWS AND INTERNAL STRUCTURE	4-1	7. LSU	11-6
1. Appearance	4-1	8. Tray paper feed section/ Paper transport section	11-7
2. Internal	4-1	9. Manual multi paper feed section	11-8
3. Operation Section	4-2	10. Power section	11-10
4. Motor, solenoid, clutch	4-3	[12] ELECTRICAL SECTION	12-1
5. Sensor, switch	4-4	1. Outline	12-1
6. PWB unit	4-5	2. MCU	12-2
7. Cross sectional view	4-6	3. CCD PWB	12-13
[5] UNPACKING AND INSTALLATION	5-1	[13] CIRCUIT DIAGRAM	13-1
1. Unpacking procedure	5-1	[14] ACTUAL WIRING DIAGRAM	14-1
2. Installing procedure	5-1		
[6] OPERATIONAL DESCRIPTIONS	6-1		
1. Outline of operation	6-1		
2. Scanner section	6-1		
3. Process section	6-2		
4. Laser unit	6-5		
5. Paper feed section	6-6		
6. Fusing section	6-7		
[7] ADJUSTMENTS	7-1		
1. Adjustment item list	7-1		
2. Copier adjustment	7-1		
[8] SIMULATIONS	8-1		
1. Entering the simulation mode	8-1		
2. Cancelling the simulation mode	8-1		
3. List of simulations	8-1		
4. Contents of simulations	8-2		

[1] GENERAL

1. General

This model is a digital personal copier produced with key words of "Comfort able copy, Clear copy, Easy copy" providing high copy performances and copy productivity.

2. Target User Copy Volume: Monthly Average

2000~3000 sheets

3. Main features

A. High-speed laser copying

- First-copy time is only 7.4 seconds (normal mode).
- Copying speed is 16 copies/min., which adapts to business use, allowing improvement of working efficiency.

B. High-quality digital image

- High-quality copying at 600 dpi is performed.
- In addition to the automatic exposure mode, the manual exposure can be adjusted in five steps.
- The photo mode copying function allows clear copying of delicate halftone original images such as monochrome photos and color photos. Photo mode is adjustable in five steps

C. Substantial copying features

- Zoom copying from 50% to 200% in 1% increments can be performed.
- Continuous copying of maximum 99 sheets can also be performed.
- Toner save mode reduces toner consumption by approximately 10%.
- User programs allow setting/modification of functions for customer needs.

D. Scan once/ Print many (AL-1610 only)

- The copier is equipped with a 1-page memory buffer. This memory allows the copier to scan an original 1 time only and make up to 99 copies. This feature allows for improved workflow, reduced operating noise from the copier and reduced wear and tear on the scanning mechanism, which provides for a higher reliability.

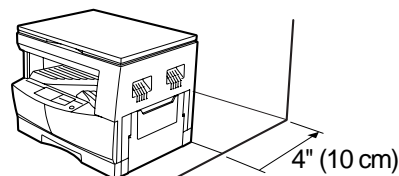
E. Environmentally friendly design

- Paper output tray is housed in the copier for space saving.
- Preheat mode and auto power shut-off mode are provided to reduce power consumption in standby mode.

4. Copier installation

Do not install your copier in areas that are:

- damp, humid, or very dusty
- exposed to direct sunlight
- poorly ventilated
- subject to extreme temperature or humidity changes, e.g., near an air conditioner or heater.
- Be sure to allow the required space around the machine for servicing and proper ventilation.



[2] SPECIFICATIONS

1. Copy mode

A. Type

Type	Desk-top
------	----------

B. Copy speed

(1) Basic speed

1 scan 1 copy	16 sheets/min	
1 scan multi copy	AL-1600	Not available
	AL-1610	Available

Condition: Copy speed in the normal copy from all the paper feed ports including the manual paper feed port.

(2) Continuous copy speed (Sheets/min)

Paper size	Normal	Enlargement (200%)	Reduction (50%)
11" × 17"	9	9	9
8.5" × 14"	10	10	10
8.5" × 13"	10	10	10
8.5" × 11"	16	16	14
8.5" × 11R"	12	12	12
8.5" × 5.5"	16	16	16

C. First copy time

First copy time	7.2sec (11" × 8.5", 1st cassette, with OC)
-----------------	--

D. Document

Max. document size	11" × 17"
Document reference position	Left side center
Detection (Platen)	None
Detection size	11" × 17", 8.5" × 14", 8.5" × 13", 8.5" × 11", 8.5" × 11R, 8.5" × 5.5"

(1) SPF/R-SPF

Standard/Option	Not available
-----------------	---------------

E. Paper feed

Copy size	(Max. ~ Min.) Cassette: (11" × 17" ~ 8.5" × 5.5")	
Paper feed system	1 cassette + Multi bypass paper feed	
Paper feed capacity	250 × 1 (Paper feed tray) + 100 (Multi bypass feed tray)(56 ~ 80g/m ² equivalent)	
Remaining quantity detection	Cassette section	Empty detection available
	Manual tray	Empty detection available

(1) Paper feed section of the copier

Paper feed size	11" × 17", 8.5" × 14", 8.5" × 13", 8.5" × 11", 8.5" × 11R, 8.5" × 5.5"
Side front	Front 1st step
Paper feed capacity	250 sheets (56 ~ 80g/m ² equivalent)
Detection	Paper empty detection available, size detection (by key input)
Weight	56 ~ 80g/m ²
Special paper	Recycled paper

(2) Manual paper feed section

Paper feed size	11" × 17" ~ 8.5" × 5.5"
Paper feed capacity	100 sheets
Detection	Size detection not available, paper empty detection available
Weight	56 ~ 128g/m ²
Special paper	Recycled paper, OHP film, labels
Paper feed	Single except for recycled paper

(3) Optional paper feed unit

	1-step paper feed unit	2-step paper feed unit
Standard/Option	Not available	Not available

F. Multi copy

Max. number of multi copy	99 sheets
---------------------------	-----------

G. Warmup time

Warmup time	Approx. 35 sec (Condition: Standard condition)
Pre-heat	Available

H. Copy magnification ratio

Fixed magnification ratio	50, 64, 77, 95, 100, 121, 129, 141, 200%
Zooming	50 ~ 200%

I. Print density

Density mode	Auto/Manual/Photo
No. of manual adjustment	5 steps (Manual/Photo)
Toner save mode	Set by the user program

J. Print area

Max. print area	Max.	428 × 275
	11" × 17"	428 × 275
	8.5" × 14"	352 × 212
	8.5" × 13"	212 × 326
	8.5" × 11"	212 × 275
	8.5" × 11R	275 × 212
	8.5" × 5.5"	212 × 136

K. Void width

Void area	Lead edge 1 ~ 4mm, rear edge 4mm or less, both side 4mm or less
Image loss	Max. 4mm in total of lead edge and rear edge, max. 4mm in total of right and left edges (Normal copy)

L. Auto duplex

Standard/Option	Not installable
-----------------	-----------------

M. Paper exit/finishing

Paper exit section capacity	Face down 250 sheets
Job separator	Job separator not available
Full detection	Not available
Finishing	Electronic sort board: Not available
Offset function	Not available
Staple function	Not available

N. Additional functions

APS	×	
AMS	×	
Duplex	×	
Document count	×	
Sorter	×	
Independent zooming	×	
1 set 2 copy	×	
Binding margin	×	
Edge erase	×	
Black-white reversion	×	
2 in 1, 4 in 1	×	
Rotation copy	×	
Memory copy	●	AL-1610 only
Pre-heat function	○	Condition set by the user program
Auto power shut off	○	Condition set by the user program
Auto tray switching	×	
Message display	×	
User program	○	
Total counter	○	

O. Machine composition

Model	
AL-1600	16 CPM standard model
AL-1610	16 CPM standard model (With shifter)

(1) Supply parts

Part name	
Toner/developer cartridge	AL-160-TD-B
Drum cartridge	AL-160-DR

P. Other specifications

Photoconductor type	OPC (Organic Photo Conductor)
Photoconductor drum dia.	30mm
Copy lamp	Xenon lamp
Developing system	Dry 2-component magnetic brush development
Charging system	Saw teeth charging
Transfer system	Non-contact (Corona) electrostatic transfer
Separation system	Natural separation
Fusing system	Heat roller + Separation pawl
Cleaning system	Contact blade

Q. Package form

Body	Body/Accessories
------	------------------

R. External view

External dimensions (W × D × H)	590 × 526 × 467 mm
Occupying area (W × D)	590 × 526mm (When the manual tray is installed.)
Weight	About 34.1kg

S. Power source

Voltage	AC120V ±15%
Frequency	50/60Hz common

T. Power consumption

Max. power consumption	About 1.3KWh
------------------------	--------------

* EnergyStar standard (The second level conformity)

Pre-heat	About 60Wh
Auto power shut off	About 4.8Wh

U. Reliability

Target users	Stand-alone copier	Monthly average 2,000 ~ 3,000 copies
--------------	--------------------	---

V. Noise

Noise	BA standard
-------	-------------

W. Digital performance

Resolution	Reading	400 dpi
	Writing	600 dpi
Gradation	Reading	256 gradations
	Writing	Binary

[3] CONSUMABLE PARTS

1. Supply system table

A. USA

No.	Name	Content	Life	Product name	Package	Remark
1	Developer cartridge (Black)	Toner/developer cartridge (Toner: 600g, Developer: 400g) × 1 Postcard label (TLABZ0025YSZZ) × 1 Returned Operation Manual × 1 Vinyl bag × 1 Warranty Card × 1	15K	AL-160TD	4	Life setting by A4 6% documents
2	Drum cartridge	Drum cartridge × 1 Warranty Card × 1	30K	AL-160DR	4	

Note: Maintenance parts other than mentioned above must be ordered through the parts department using the proper part number.

B. Canada

No.	Name	Content	Life	Product name	Package	Remark
1	Developer cartridge (Black)	Toner/developer cartridge (Toner: 600g, Developer: 400g) × 1 Postcard label (TLABZ0025YSZZ) × 1 Returned Operation Manual × 1 Vinyl bag × 1	15K	AL-160TD	4	Life setting by A4 6% documents
2	Drum cartridge	Drum cartridge × 1	30K	AL-160DR	4	

Note: Maintenance parts other than mentioned above must be ordered through the parts department using the proper part number.

C. Europe

No.	Name	Content	Life	Product name	Package	Remark
1	Developer cartridge (Black)	Toner/developer cartridge (Toner: 600g, Developer: 400g) × 1 Postcard label (TLABZ0025YSZZ) × 1 Returned Operation Manual × 1 Vinyl bag × 1	15K	AL-160TD	4	Life setting by A4 6% documents
2	Drum cartridge	Drum cartridge × 1	30K	AL-160DR	4	

Note: Maintenance parts other than mentioned above must be ordered through the parts department using the proper part number.

D. Australia, New Zealand, Southeast Asia, LAG, Middle East

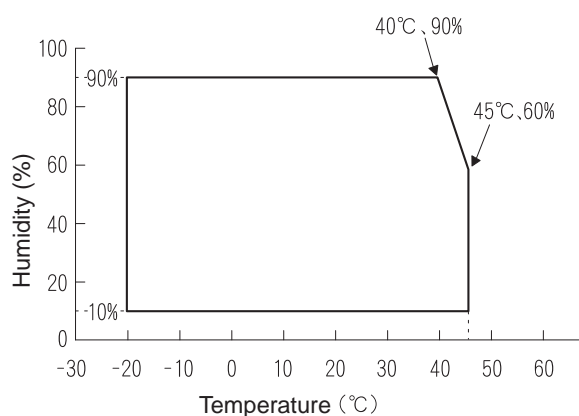
No.	Name	Content	Life	Product name	Package	Remark
1	Developer cartridge (Black)	Toner/developer cartridge (Toner: 600g, Developer: 400g) × 1	15K	AL-160TD	4	Life setting by A4 6% documents
2	Drum cartridge	Drum cartridge × 1	30K	AL-160DR	4	

Note: Maintenance parts other than mentioned above must be ordered through the parts department using the proper part number.

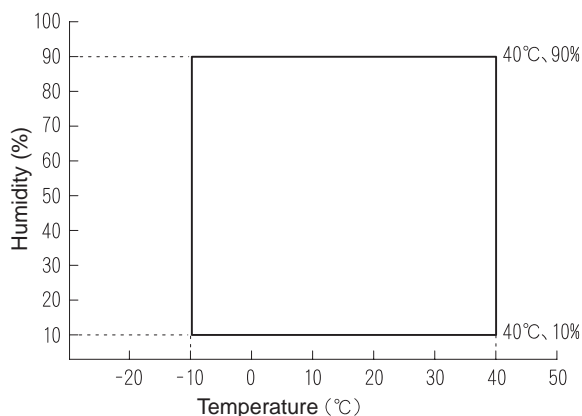
2. Environment conditions

A. Transport condition

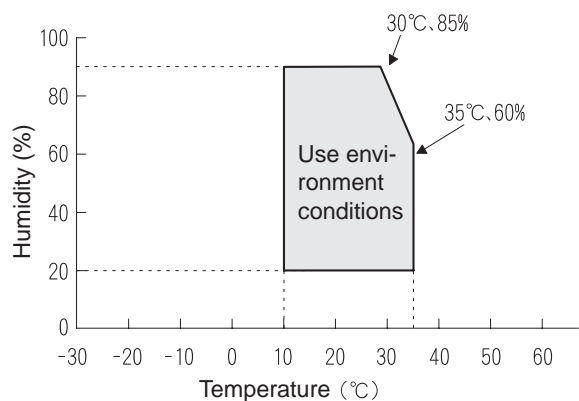
(1) Transport conditions



(2) Storage conditions (packed conditions)



B. Use conditions



C. Life (packed conditions)

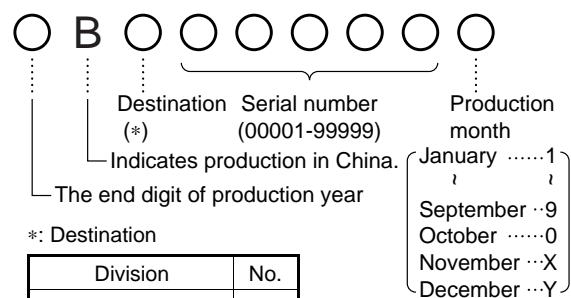
Photoconductor drum (36 months from the production month)

Developer, toner (24 months from the production month)

3. Production number identification

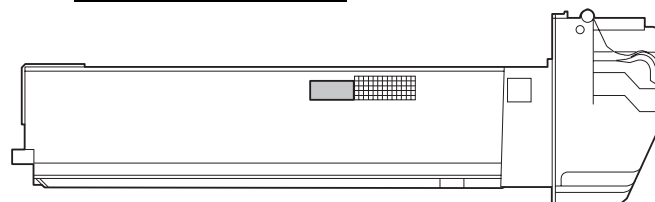
<Developing cartridge>

The label on the drum cartridge shows the date of production.



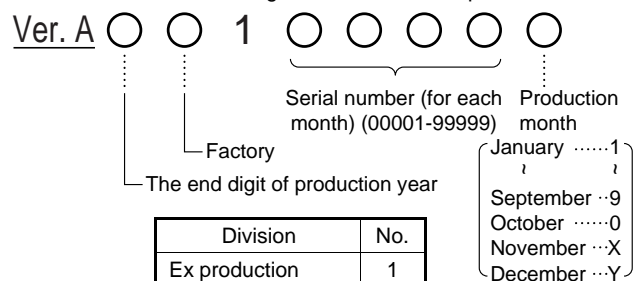
*: Destination

Division	No.
Japan option	1
Ex option	2
Japan, same pack	6
Ex, same pack	7

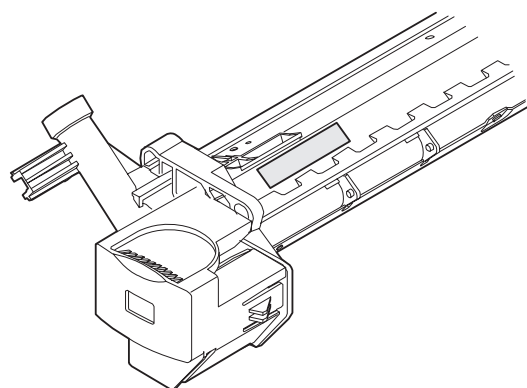


<Drum cartridge>

The label on the drum cartridge shows the date of production.

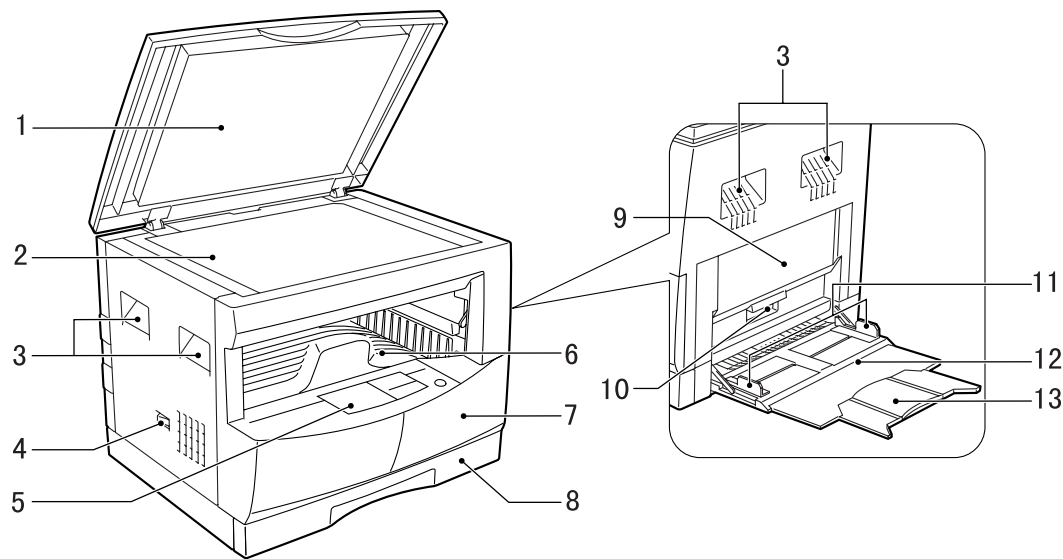


Division	No.
Ex production	1
Option	2
Same pack	3



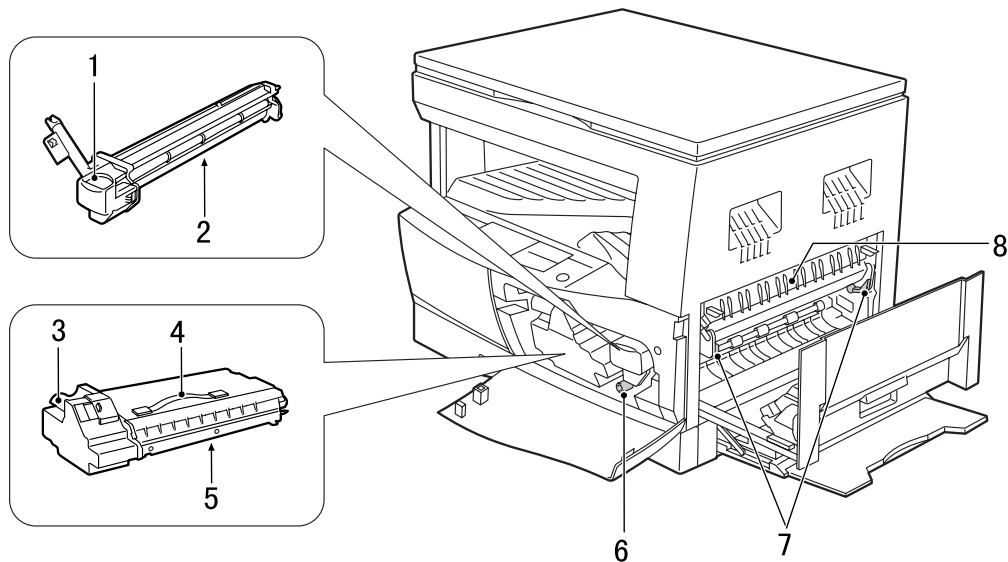
[4] EXTERNAL VIEWS AND INTERNAL STRUCTURES

1. Appearance



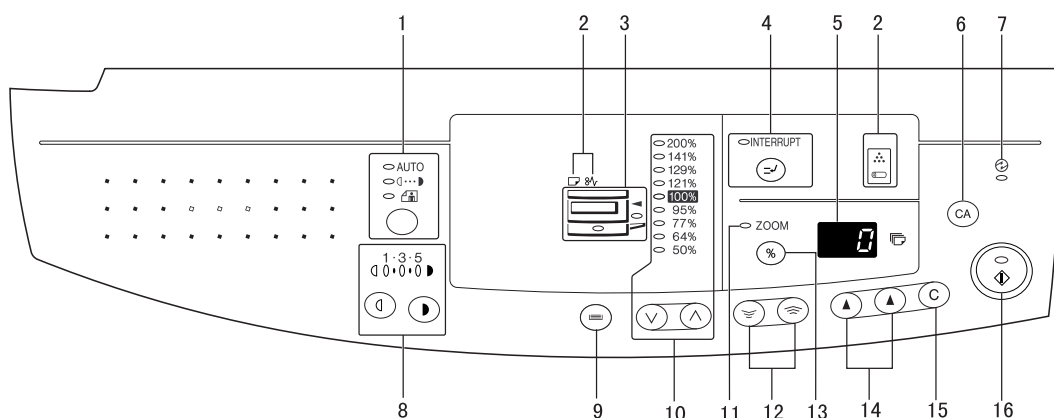
1	Original cover	2	Original table (OC table)	3	Handles
4	Power switch	5	Operation panel	6	Paper output tray
7	Original size detector	8	Front cover	9	Paper tray
10	Side cover	11	Side cover handle	12	Bypass tray guides
13	Bypass tray				

2. Internal



1	Bypass tray extension	2	Drum cartridge handle	3	Drum cartridge
4	TD cartridge handle	5	TD cartridge strap	6	TD cartridge
7	Roller rotating knob	8	Fusing unit release levers	9	Paper guide

3. Operation Section



1	AUTO/MANUAL/PHOTO key and indicators	2	Alarm indicators	3	Paper feed location/misfeed location indicators
4	Interrupt key and indicator	5	Copy quantity display	6	CLEAR ALL key
7	POWER SAVE indicator	8	Light and dark keys and indicators	9	TRAY SELECT key
10	PRESET RATIO selector keys and indicators	11	ZOOM indicator	12	Zoom keys
13	Copy ratio display key	14	Copy quantity keys	15	CLEAR key
16	START key and indicator				

* 1



TD cartridge replacement required indicator

The TD cartridge replacement required indicator will light up when toner is needed. If copying is continued while the indicator is lit, copies will gradually become lighter until the copier stops and the indicator begins blinking. Replace the old TD cartridge by following the procedure given below.

After the copier stops, it may be possible to make a few more copies by taking the TD cartridge out of the copier, shaking it horizontally, then reinstalling it. If copying is not possible after this operation, replace the TD cartridge. During long copy run of a dark original, the START key indicator may blink, the indicator light up, and the copier stop, even though toner is left. The copier will feed toner for up to 2 minutes and then the START key indicator will light up. Press the START key to restart copying.

For best copying results, be sure to use only SHARP Genuine Supplies which are designed, engineered and tested to maximize the life and performance of SHARP copiers. Look for the Genuine Supplies label on the toner package.



Drum replacement required indicator

The useful life of the drum cartridge is approximately 30,000 copies. When the internal counter reaches approximately 29,000 copies, the drum replacement required indicator will light up indicating that replacement of the drum cartridge will be needed soon. When the indicator begins to blink, replace the drum cartridge by following the procedure given below.



Paper required indicator



Misfeed indicator

* 2

ON: Indicates that the machine is in the energy saving (pre-heat) mode.

Blink: Indicates that the machine is in the process of resetting from the energy saving mode or just after supplying the power.

OFF: Indicates that resetting from the energy saving mode is completed and that the fusing temperature is in ready state.

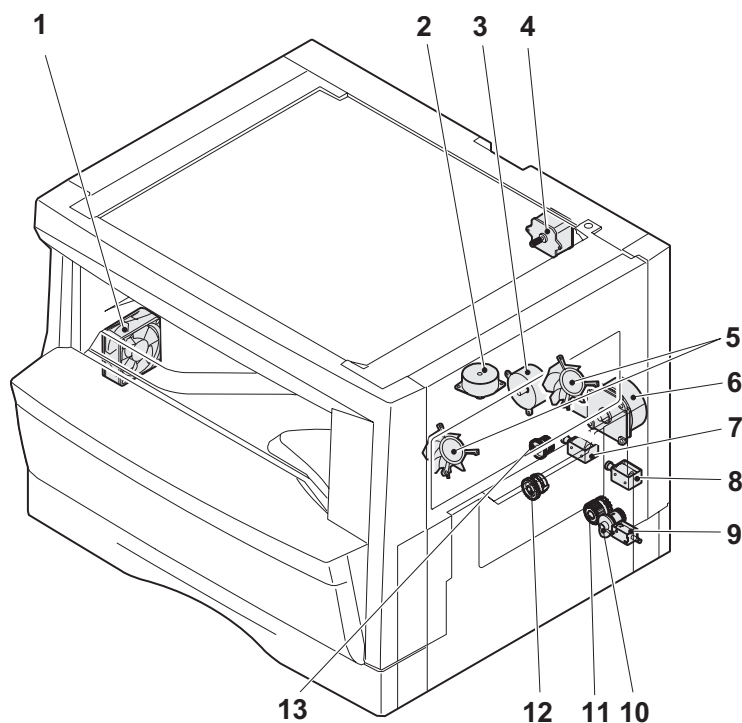
The combinations of the above display lamps are as follows:

(○ = ON, ● = OFF)

Lamp	Immediately after power ON	Ready	Copying
Pre-heat lamp	Blink	●	●
Ready lamp	●	○	●
Other lamps	●	○	○

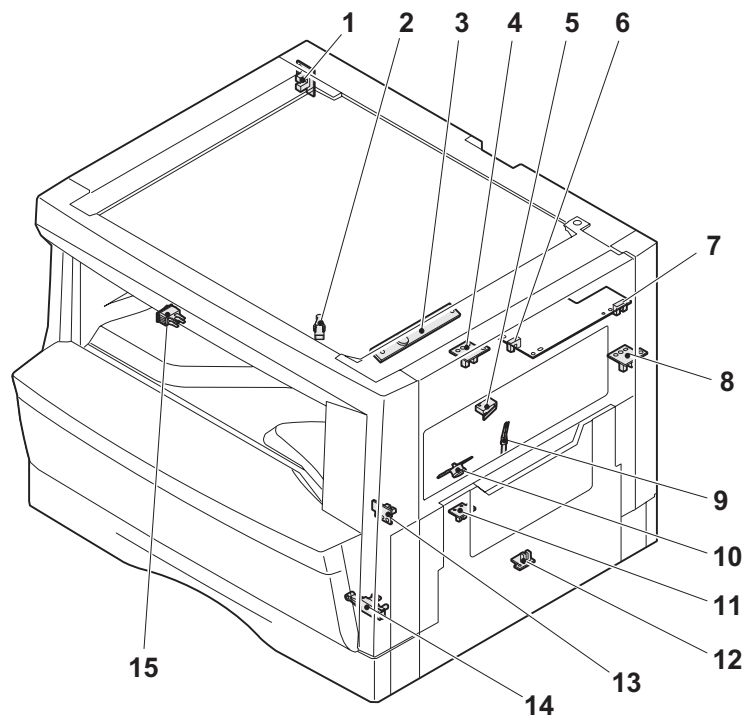
Lamp	Energy saving mode (Pre-heating)	Energy saving mode (Auto power shut off)	Resetting from energy saving mode	Copy is started during resetting from energy saving mode
Pre-heat lamp	○	○	Blink	Blink
Ready lamp	○	●	○	●
Other lamps	○	●	○	○

4. Motor, solenoid, clutch



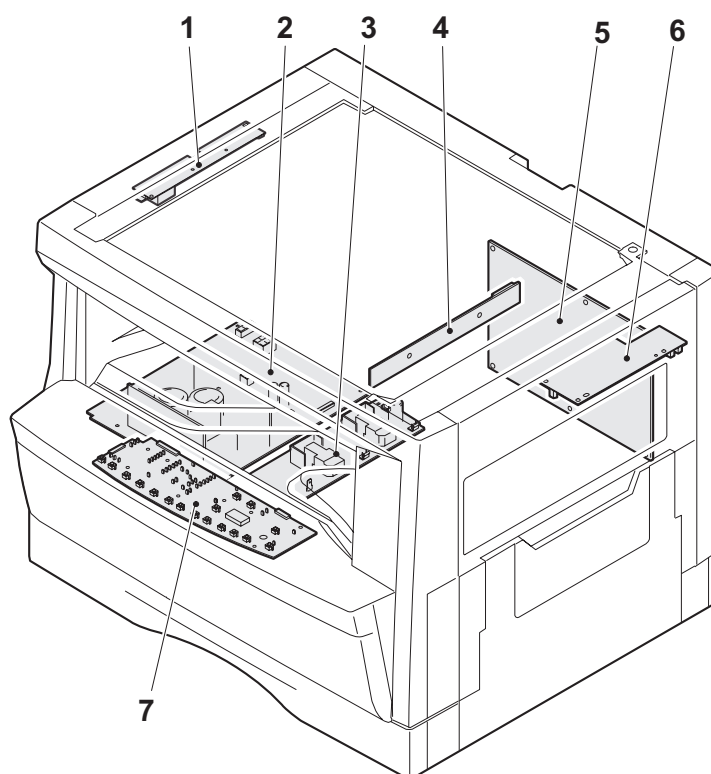
No.	Name	Code	Function, operation
1	Exhaust fan motor	VFM	Cools the inside of the machine.
2	Shifter motor		Shifts the paper exit tray. (AL-1610)
3	Toner motor	TM	Toner supply
4	Mirror motor	MRM	Drives the optical mirror base (scanner unit).
5	Cooling fan motor	CFM	Cools the inside of the machine.
6	Main motor	MM	Drives the machine.
7	Paper feed solenoid	CPFS1	Solenoid for paper feed from cassette
8	Resist roller solenoid	RRS	Resist roller rotation Resist roller rotation control solenoid
9	Manual paper feed solenoid	MPFS	Manual paper feed solenoid
10	Manual paper transport clutch	MPTC	Drives the manual paper transport roller.
11	Manual paper feed clutch	MPFC	Drives the manual paper feed roller.
12	Paper feed clutch	CPFC1	Drives the cassette paper feed roller.
13	Clutch	RRC	Drives the resist roller

5. Sensor, switch



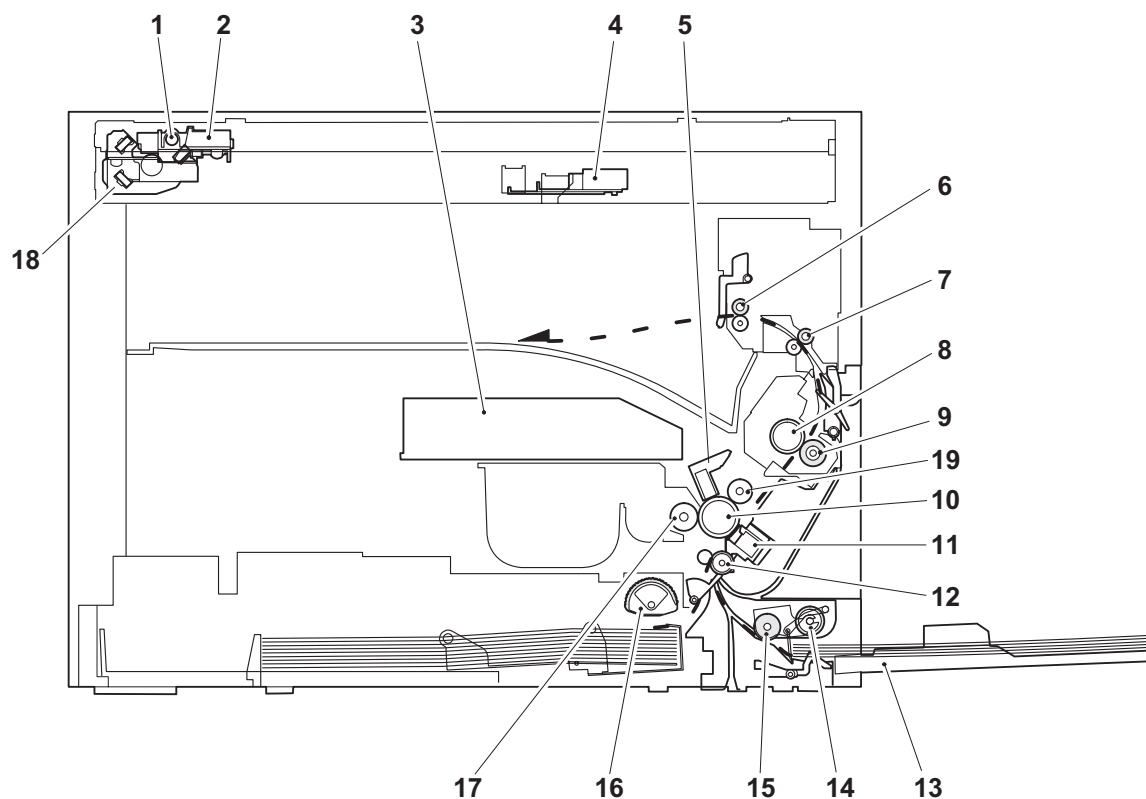
No.	Name	Code	Function, operation
1	Mirror home position sensor	MHPS	Detects the mirror (scanner unit) home position.
2	Cassette detection switch	CSD1	Cassette detection
3	Toner density sensor	TCS	Toner quantity detection
4	Paper exit sensor (paper exit side)	POD1	Detects paper exit.
5	Right door switch	DSWR	Side door open/close detection
6	Paper full sensor		Paper exit tray section full detection <For JOB separator>
7	Lift sensor		Paper feed tray lift up detection <For JOB separator>
8	Paper exit sensor (DUP side)	POD2	Paper transport detection
9	Thermistor		Fusing section temperature detection
10	Thermostat		Fusing section abnormally high temperature detection
11	Paper transport sensor	PPD	Paper transport detection
12	Manual sensor	MPED	Manual transport detection
13	Cassette paper sensor	PED1	Cassette paper empty sensor
14	Drum reset switch	DRST	New drum detection switch
15	Power switch		Turns ON/OFF the main power source.

6. PWB unit



No.	Name	Function, operation
1	Copy lamp inverter PWB	Copy lamp control
2	Power PWB	AC power input/DC power control
3	High voltage PWB	High voltage control
4	CCD sensor PWB	Image scanning
5	Main PWB (MCU)	Machine control/Image process
6	Paper exit interface PWB	Paper exit, finishing control
7	Operation main PWB	Operation panel input/Display, operation panel section control

7. Cross sectional view

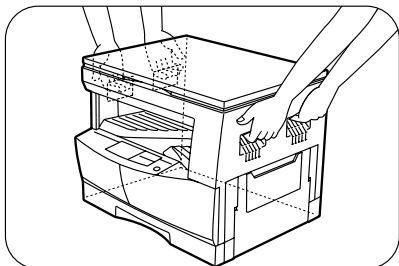


No.	Name	Function/Operation
1	Copy lamp	Image radiation lamp
2	Copy lamp unit	Operates in synchronization with No. 2/3 mirror unit to radiate documents sequentially.
3	LSU unit	Converts image signals into laser beams to write on the drum.
4	Lens unit	Reads images with the lens and the CCD.
5	MC holder unit	Supplies negative charges evenly on the drum.
6	Paper exit roller	Used to discharge paper.
7	Transport roller	Used to transport paper.
8	Upper heat roller	Fuses toner on paper (with the teflon roller).
9	Lower heat roller	Fuses toner on paper (with the silicon rubber roller).
10	Drum unit	Forms images.
11	Transfer charger unit	Transfer images (on the drum) onto paper.
12	Resist roller	Takes synchronization between the paper lead edge and the image lead edge.
13	Manual paper feed tray	Manual paper feed tray
14	Manual paper feed roller	Picks up paper in manual paper feed.
15	Manual transport roller	Transports paper from the manual paper feed port.
16	Paper feed roller (semi-circular roller)	Picks up paper from the cassette.
17	MG roller	Puts toner on the OPC drum.
18	No. 2/3 mirror unit	Reflects the images from the copy lamp unit to the lens unit.
19	Waste toner transport roller	Transports waste toner to the waste toner box.

[5] UNPACKING AND INSTALLATION

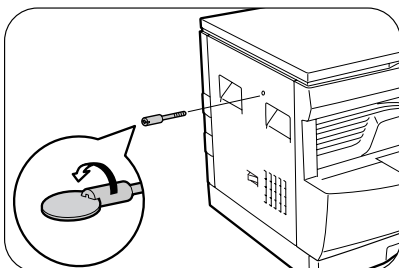
1. Unpacking procedure

Be sure to hold the handles on both sides of the copier by two persons to unpack the copier and carry it to the installation location.

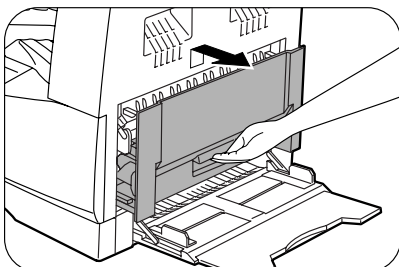


2. Installing procedure

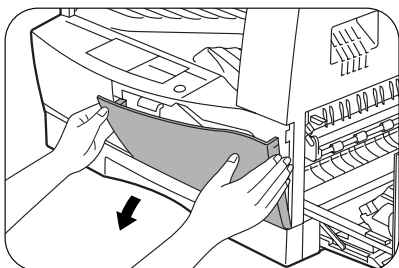
- 1) Remove all pieces of tape. Then open the original cover and remove the protective material.
- 2) Use a coin (or suitable object) to remove the screw.
 - Store the screw in the paper tray because it will be used if the copier has to be moved. (Refer to the description in the following.)



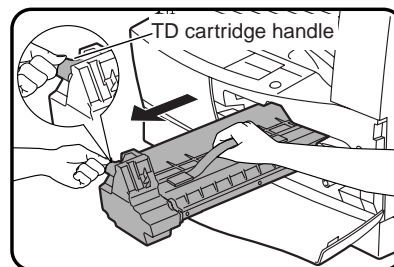
- 3) Ensure that the bypass tray is open. Raise the side cover release handle and pull out the side cover until it stops.



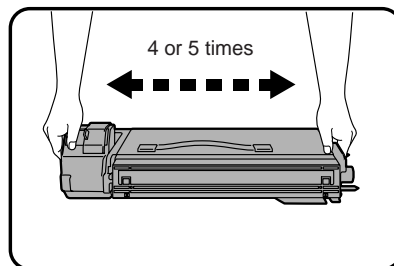
- 4) Push gently on both sides of the front cover to open the cover.



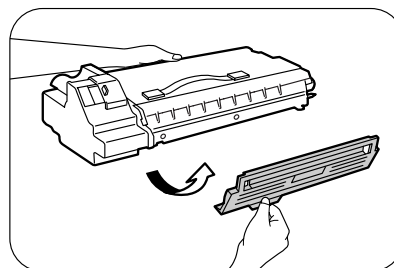
- 5) Gently pull the TD cartridge out while holding the handle.
- 6) Hold the strap on the cartridge and remove the TD cartridge upward.



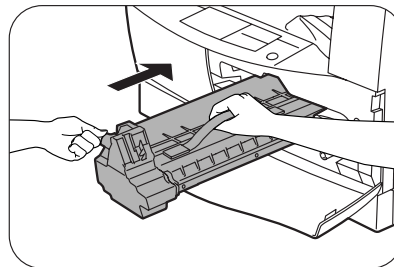
- 7) Remove the new TD cartridge from the bag. Hold the cartridge on both sides and shake it horizontally four or five times.



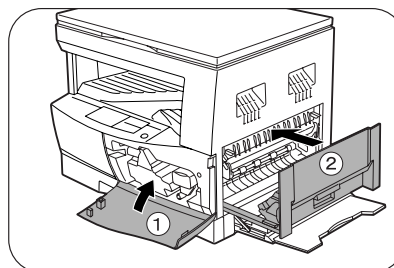
- 8) Hold the tab of the protective cover and pull the tab towards you to remove the cover.



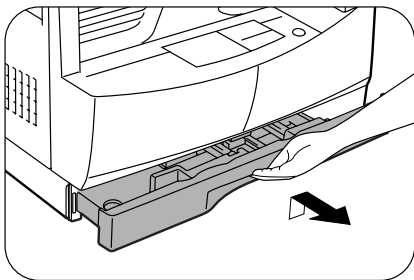
- 9) Gently insert the TD cartridge along the guides until it locks in place.
 - If dirt or dust is adhered to the TD cartridge, remove it before installing the cartridge.



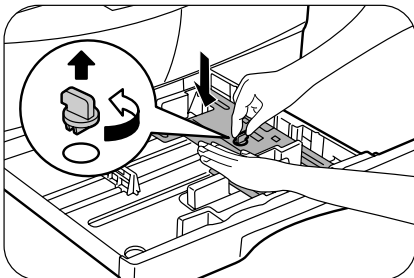
- 10) Close the front cover by holding both sides with your hands and then close the side cover. The TD cartridge replacement required indicator will go out and the START key indicator will light up.
 - When closing the covers, be sure to close the front cover securely and then close the side cover. If the covers are closed in the wrong order, the covers may be damaged.



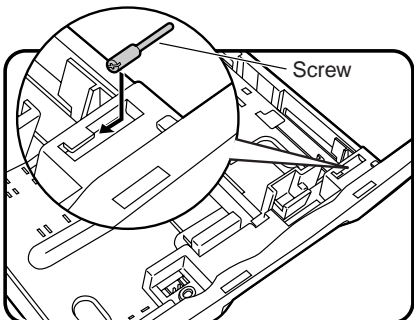
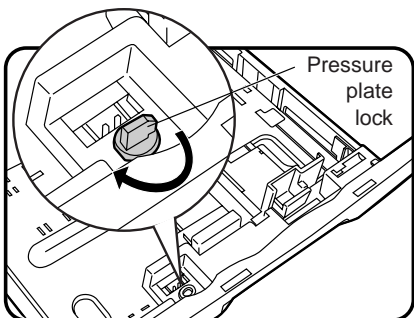
- 11) Raise the handle of the paper tray and pull the paper tray out until it stops.



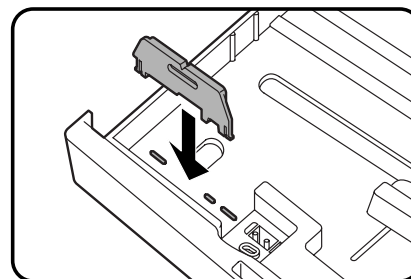
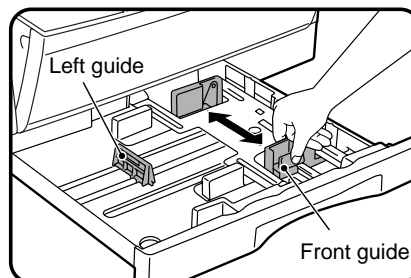
- 12) Remove the pressure plate lock. Rotate the pressure plate lock in the direction of the arrow to remove it while pressing down the pressure plate of the paper tray.



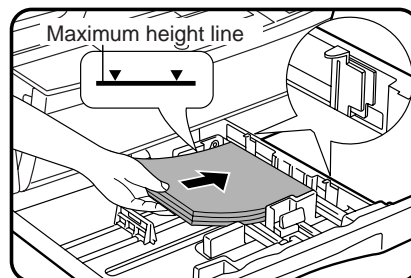
- 13) Store the pressure plate lock which has been removed in step 5 and the screw which has been removed in step 2 in the front of the paper tray.
- To store the pressure plate lock, rotate the lock to fix it on the relevant location.



- 14) Push the pressure plate down until it locks in place.
- 15) Squeeze the lock lever of the front guide and slide the front guide to match the width of the paper.
- 16) Move the left guide to the appropriate slot as marked on the tray.
- When using 11" × 17" copy paper, store the left guide in the slot at the left front of the paper tray.



- 17) Load copy paper into the tray.
- Set the paper along the guides.
 - The tray holds up to 250 sheets of about 9kg bond paper. Do not load paper above the maximum height line.



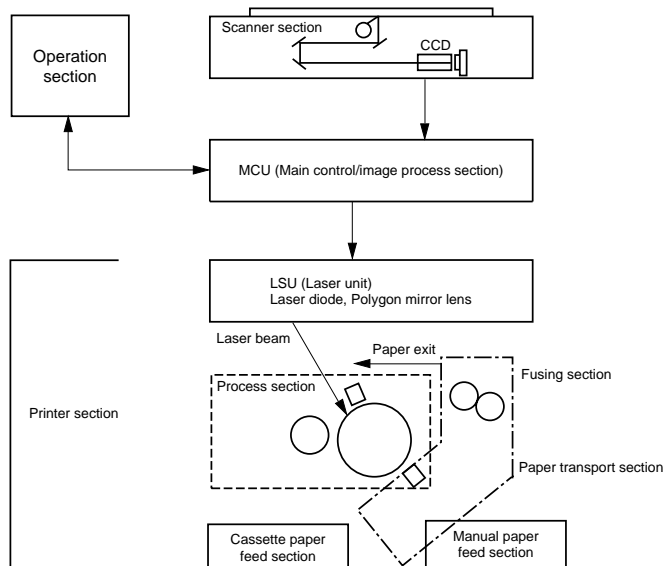
- 18) Push the paper tray firmly back into the copier.
- 19) Ensure that the power switch of the copier is in the OFF position. Insert the supplied power cord into the power cord socket at the rear of the copier.
- If you use the copier in a country other than the country where the copier was purchased, you will need to make sure that your local power supply is compatible with your model. If you plug the copier into an incompatible power supply, irreparable damage to the copier will result.
- 20) Plug the other end of the power cord into the nearest outlet.
- Only insert the power cord into a properly grounded wall socket. Do not use extension cords or power strips.

[6] OPERATIONAL DESCRIPTIONS

1. Outline of operation

The outline of operation is described referring to the basic configuration.

(Basic configuration)



Outline of copy operation

A. Setting conditions: Operation panel

- Set copy conditions such as the copy quantity and the copy density with the operation section, and press the START key. The information on copy conditions is sent to the MCU.

B. Image scanning: Scanner section

- When the START key is pressed, the scanner section starts scanning of images. The light from the copy lamp is reflected by the document and passed through the lens to the CCD.

C. Photo signal/Electric signal conversion: Scanner section

- The image is converted into electrical signals by the CCD circuit and passed to the MCU.

D. Image process: MCU

- The document image signal sent from the CCD circuit is processed under the revised conditions and sent to the LSU (laser unit) as print data.

E. Electric signal/Photo signal (laser beam) conversion: LSU

- The LSU emits laser beams according to the print data. (Electrical signals are converted into photo signals.)
- The laser beams are radiated through the polygon mirror and various lenses to the OPC drum.

F. Printing: Process section

- Electrostatic latent images are formed on the OPC drum according to the laser beams, and the latent images are developed to be visible images (toner images).
- Meanwhile the paper is fed to the image transfer section in synchronization with the image lead edge.
- The toner image is transferred on the paper.

G. Fusing: Fusing section

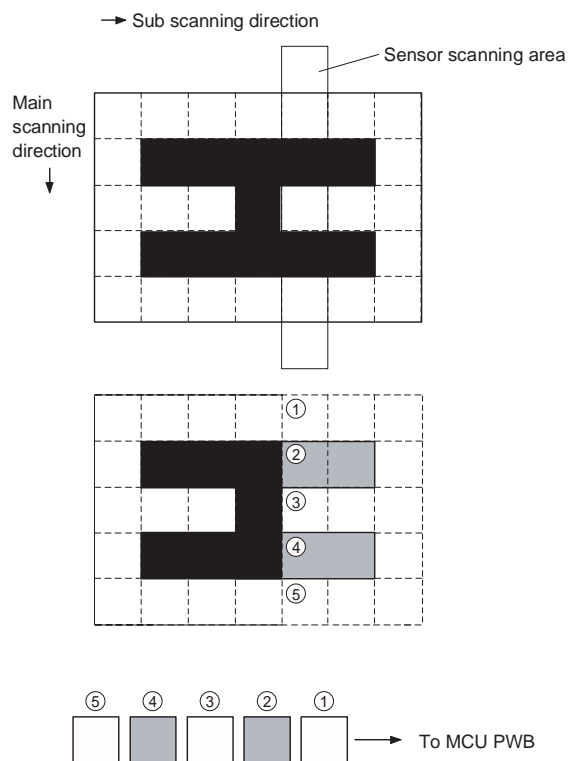
- Heat and a pressure are applied to the toner image on the copy paper to fuse the image on the paper.

2. Scanner section

A. Scan process

The scanner has sensors that are arranged in a line. These sensors scan a certain area of a document at a time and deliver outputs sequentially. When the line is finished, the next line is scanned, and this procedure is repeated. The figure below shows the case where an image which is scanned is shown with solid lines.

The direction of this line is called main scanning direction, and the scanning direction sub scanning direction. In the figure above, one line is divided into 5 sections. Actually, however, one line is divided into thousands of sections. For scanning, the light receiving element called CCD is used.

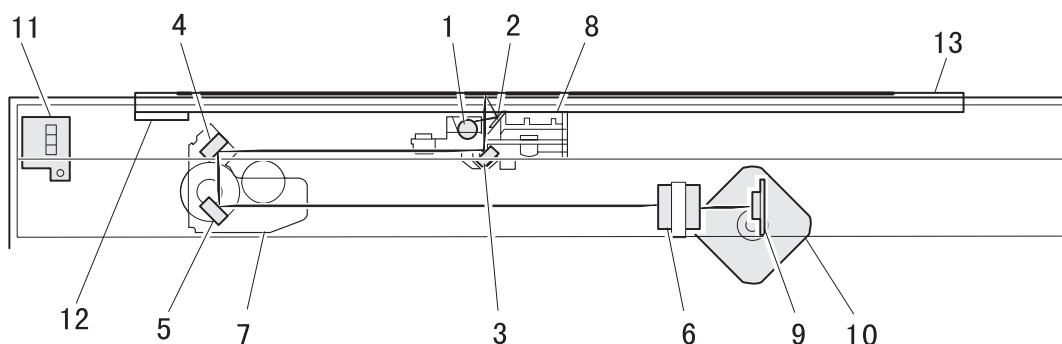


The basic resolution indicates the scanner capacity. The basic resolution is expressed in dpi (dot/inch) which shows the number of light emitting elements per inch on the document.

The basic resolution of this machine is 400dpi.

In the sub scanning direction, at the same time, the motor that drives the optical system is controlled to scan the image at the basic resolution.

B. Basic structure of scanner section

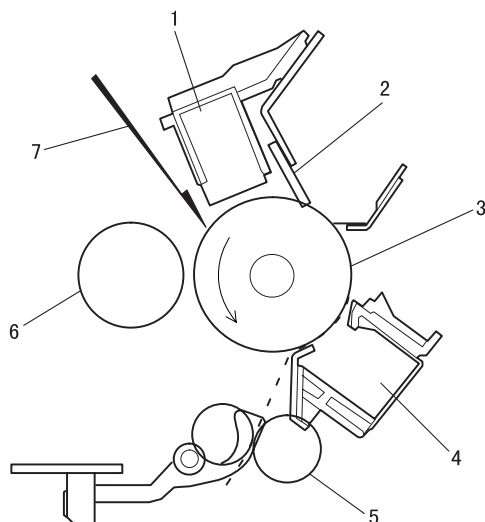


1	Copy lamp (Xenon lamp)	Generate photo energy to scan documents.
2	Reflector (Converging plate)	Collects light emitted from the copy lamp and radiate the document.
3	No. 1 mirror	Refracts the reflection light from the document to No. 2 mirror.
4	No. 2 mirror	Refracts the reflection light from No. 1 mirror.
5	No. 3 mirror	Refracts the reflection light from No. 2 mirror.
6	Lens	Converges reflected light from the document to form images on the CCD element.
7	No. 2/3 mirror unit	Includes No. 2/3 mirror. Driven in synchronization with the copy lamp unit.
8	Copy lamp unit	Includes the copy lamp, the reflector, and No. 1 mirror. Driven in synchronization with No. 2/3 mirror unit by the mirror motor.
9	CCD PWB	Reflected light (image) formed on the CCD is converted into electrical signals (analog signals) then into digital signals and sent to the MCU.
10	Mirror motor	Drives the copy lamp unit and No. 2/3 mirror unit according to the scanning speed.
11	MHPS (Mirror home position sensor)	Detects the home position of No. 2/3 mirror unit.
12	Reference white plate	Reference white sheet for scanning documents. The reference line of magnification ratio adjustment during SIM is also drawn.
13	OC glass	Glass table to put a document on it.

The light from the light source (Xenon lamp) is reflected by a document and passed through three mirrors and reduction lenses to the CCD element (image sensor) where images are formed. This system is known as the reduction image sensor system. Photo energy on the CCD element is converted into electrical signals (analog signals). (Photo-electric conversion). The output signals (analog signals) are converted into digital signals (A/D conversion) and passed to the MCU (main control/image process section). The resolution at that time is 400dpi. The mirror unit in the scanner section is driven by the mirror motor. The MHPS is provided to detect the home position of the copy lamp unit.

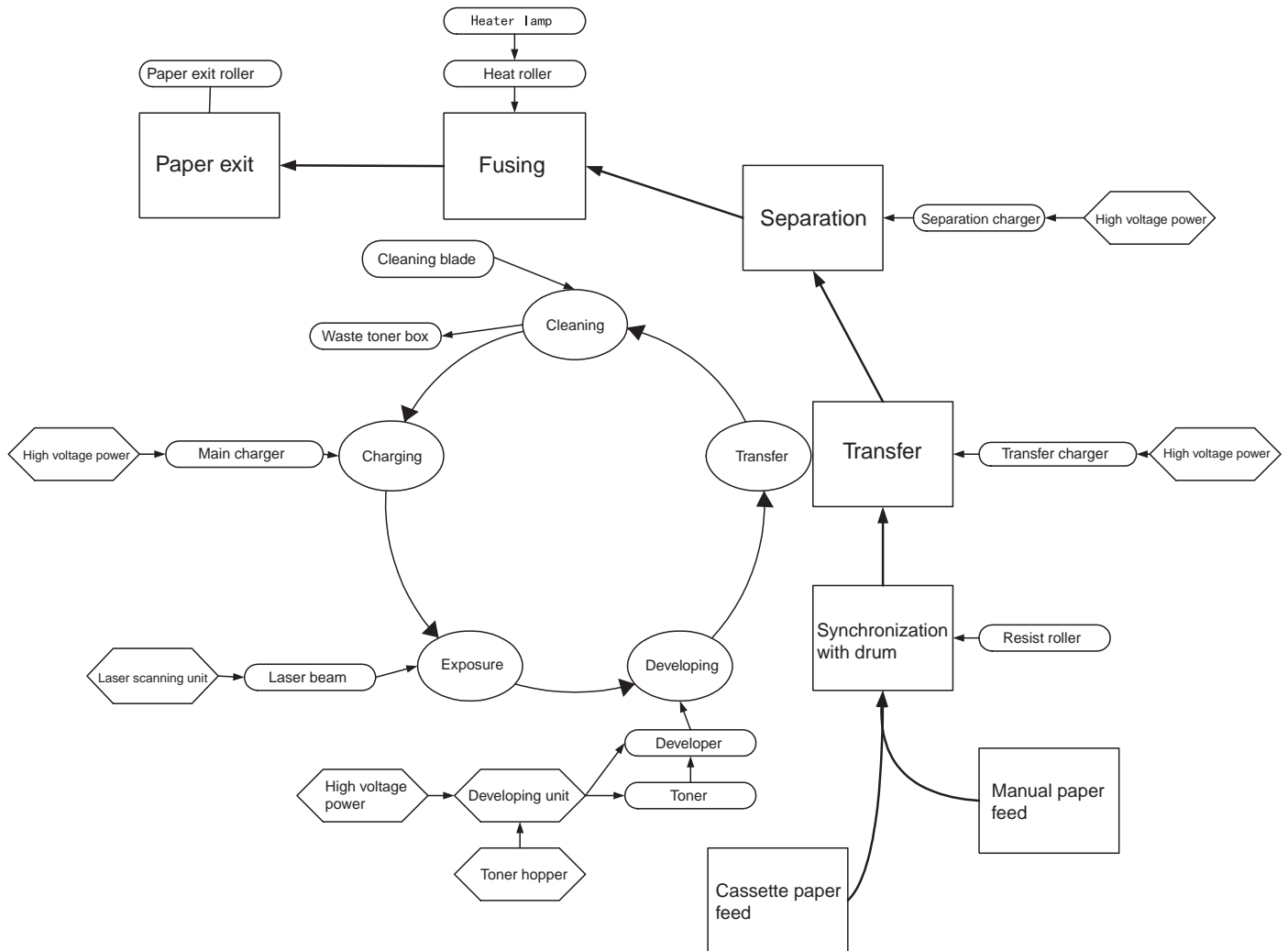
3. Process section

A. Basic structure



1	Main charger unit	Charges the OPC drum.
2	Cleaning blade	Collects waste toner on the OPC drum.
3	OPC drum	Images are formed by laser beams electrically, and toner is attached to the image.
4	Transfer unit	Toner on the OPC drum is transferred to the print paper by the potential difference.
5	Resist roller	Makes synchronization between the paper and the print image.
6	MG roller	Magnetic brush is formed by developer to put toner on the OPC drum.
7	(Laser beam)	Forms images on the OPC drum.

Operation cycle



B. Outline of print process

The printer section of this machine employs the laser print system where print images are formed by the laser beams on the OPC drum.

A high voltage (corona) is applied from the main charger to the OPC drum to charge the OPC drum.

Laser beams are radiated to the charged OPC drum to form electrical images on the OPC drum. (Exposure)

(At that time, the print image on the OPC drum cannot be seen: latent electrostatic image)

By the potential difference between the unexposed area and the latent electrostatic images, toner is attracted only to the images. (Developing)

(At that time, the print image formed by toner on the OPC drum can be seen. Visible images)

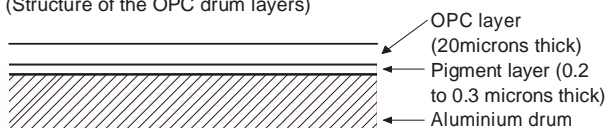
The toner image on the OPC drum is transferred on the print paper by the transfer corona (voltage).

After that, the print paper with the toner image on it is subject to heat and pressure in the fusing section to fuse the image on the paper.

This machine employs the following organic photoconductor (OPC) drum.

An OPC drum is used for the photoconductor.

(Structure of the OPC drum layers)

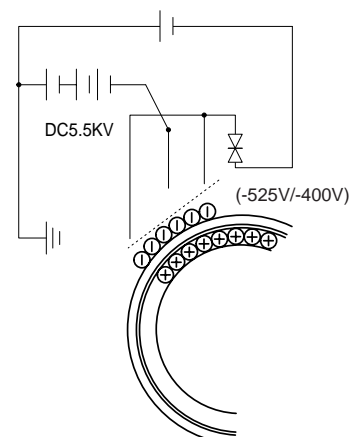


C. Actual print process

(1) Charging

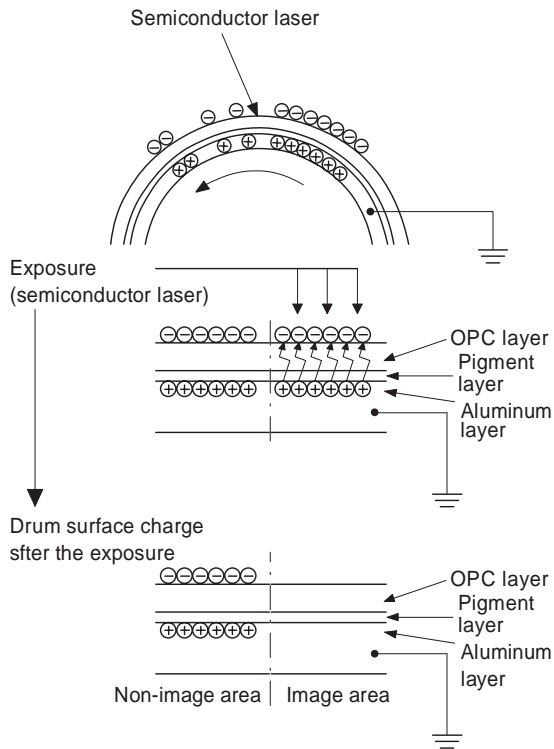
A high voltage is applied to the main charger, and negative charges are discharged to the OPC drum. A screen grid is provided between the main charger and the OPC drum, and negative charges are uniformly charged on the OPC drum surface.

Positive charges are attracted by the negative electrode on the OPC drum surface and excited in the aluminum layer in the OPC drum.



(2) Exposure

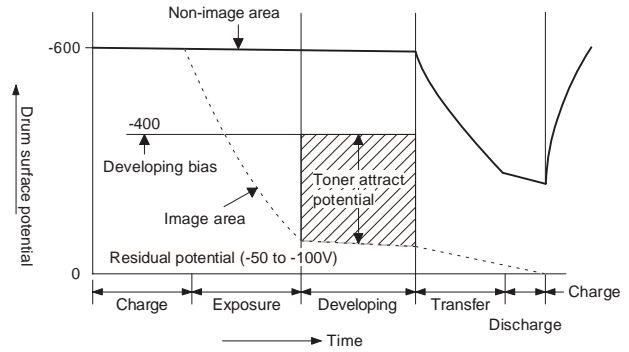
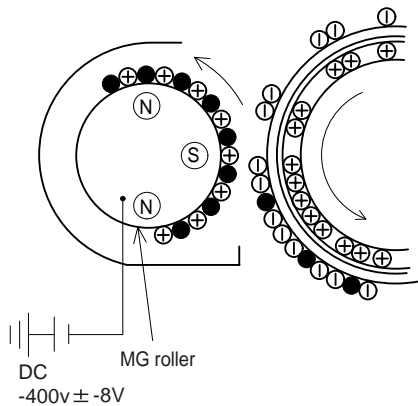
A Laser beam is generated from the semiconductor laser and controlled by the print pattern signal. The laser writes onto the OPC drum surface through the polygon mirrors and lens. The resistance of the OPC layer decreases for an area exposed by the laser beam (corresponding to the print pattern signal). The beam neutralizes the negative charge. An electrostatic latent image is formed on the drum surface.



(3) Developing (DC bias)

A bias potential is applied to the MG roller in the two component magnetic brush developing method, and the toner is charged negative through friction with the carrier. Non-image area of the drum surface charged with negative potential repel the toner, whereas the laser exposed portions where no negative charges exist, attract the toner. As a result, a visible image appears on the drum surface.

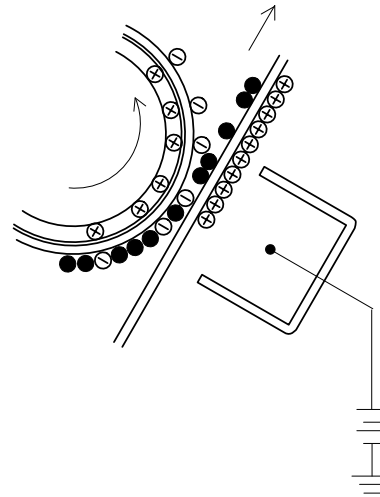
- ⊕ : Carrier (Magnetized particle)
- : Toner (Charge negative by friction)
- (N) (S) : Permanent magnet (provided in three locations)



Toner is attracted over the shadowed area because of the developing bias.

(4) Transfer

The visible image on the drum surface is transferred onto the print paper by applying a positive charge from the transfer corona to the backside of the print paper.

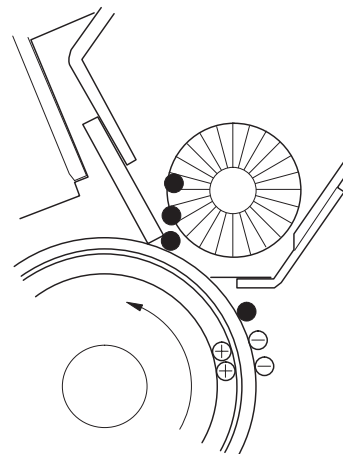


(5) Separation

Since the print paper is charged positively by the transfer corona, it is discharged by the separation corona. The separation corona is connected to ground.

(6) Cleaning

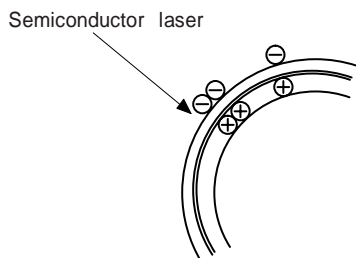
Toner remaining on the drum is removed and collected by the cleaning blade. It is transported to the waste toner collecting section in the cleaning unit by the waste toner transport roller.



(7) Optical discharge (Semiconductor laser)

Before the drum rotation is stopped, the semiconductor laser is radiated onto the drum to reduce the electrical resistance in the OPC layer and eliminate residual charge, providing a uniform state to the drum surface for the next page to be printed.

When the electrical resistance is reduced, positive charges on the aluminum layer are moved and neutralized with negative charges on the OPC layer.



a. Charge by the Scorotron charger

<1> Function

The Scorotron charger functions to maintain the surface potential of the drum even at all times which. It is used to control the surface potential regardless of the charge characteristics of the photoconductor.

<2> Basic function

A screen grid is placed between the saw tooth and the photoconductor. A stable voltage is added to the screen grid to maintain the corona current on the photoconductor. As the photoconductor is charged by the saw tooth from the main corona unit, the surface potential increases. This increases the current flowing through the screen grid. When the photoconductor potential nears the grid potential, the current turns to flow to the grid so that the photoconductor potential can be maintained at a stable level.

b. Process controlling

<1> Function

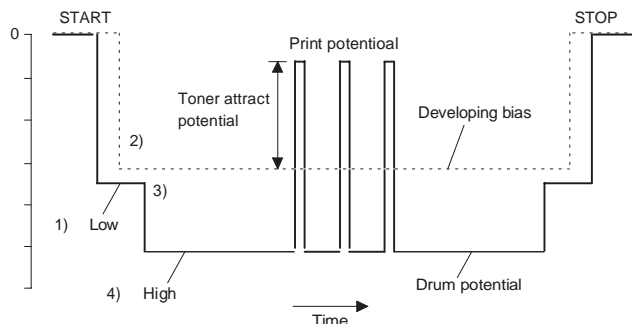
The print pattern signal is converted into an invisible image by the semiconductor laser using negative to positive (reversible) developing method. Therefore, if the developing bias is added before the drum is charged, toner is attracted onto the drum. If the developing bias is not added when the drum is charged, the carrier is attracted to the drum because of the strong electrostatic force of the drum.

To avoid this, the process is controlled by adjusting the drum potential and the grid potential of the Scorotron charger.

<2> Basic function

Voltage added to the screen grid can be selected, high and low.

To make it easily understood, the figure below shows voltage transition at the developer unit.



<3> Start

- 1) Because the grid potential is at a low level, the drum potential is at about $-400V$. (Carrier may not be attracted though the carrier is pulled towards the drum by the electrostatic force of $-400V$.)
- 2) Developing bias ($-400V$) is applied when the photoconductor potential is switched from LOW to HIGH.
- 3) Once developing bias ($-400V$) is applied and the photoconductor potential rises to HIGH, toner will not be attracted to the drum.

<4> Stop

The reverse sequence takes place.

c. Retaining developing bias at an abnormal occurrence

<1> Function

The developing bias will be lost if the power supply was removed during print process. In this event, the drum potential slightly abates and the carrier makes deposits on the drum because of strong static power. To prevent this, the machine incorporates a function to retain the developing bias for a certain period and decrease the voltage gradually against possible power loss.

<2> Basic function

Normally, the developing bias voltage is retained for a certain time before the drum comes to a complete stop if the machine should stop before completing the normal print cycle. The developing bias can be added before resuming the operation after an abnormal interruption. Therefore, carrier will not make a deposit on the drum surface.

4. Laser unit

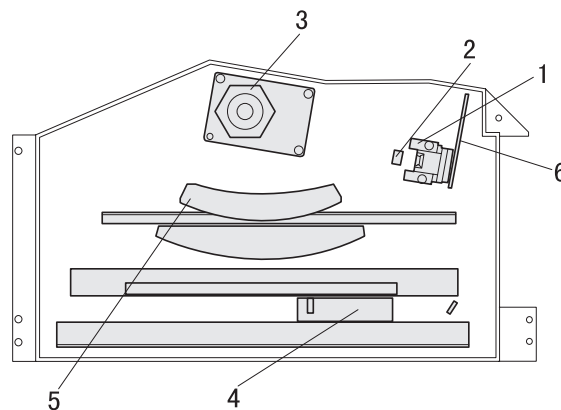
The image data sent from the MCU (image process circuit) is sent to the LSU (laser unit), where it is converted into laser beams.

A. Basic structure

The LSU unit is the writing section of the digital optical system.

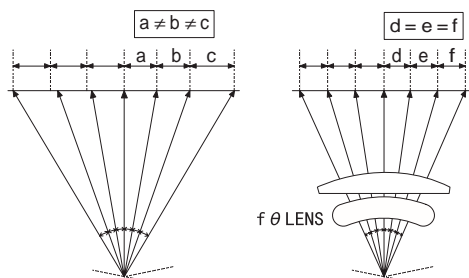
The semiconductor laser is used as the light source, and images are formed on the OPC drum by the polygon mirror and $f\theta$ lens, etc.

The laser beams are passed through the collimator lens, the cylindrical lens, the polygon mirror, the $f\theta$ lens, and the mirror to form images on the OPC drum in the main scanning direction. The laser emitting PWB is provided with the APC (auto power control) in order to eliminate fluctuations in the laser power. The BD PWB works for measurement of the laser writing start point.

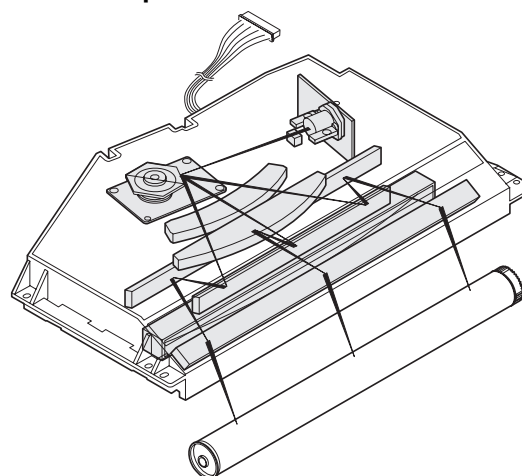


1	Semiconductor laser	Generates laser beams
2	Collimator lens	Converges laser beams in parallel
3	Polygon mirror, polygon motor	Reflects laser beams at a constant rpm
4	BD (Mirror, lens, PWB)	Detects start timing of laser scanning
5	$f\theta$ lens	Converges laser beams at a spot on the drum. Makes the laser scanning speeds at both ends of the drum same as each other. (Refer to the figure below.)
6	Laser emitting PWB	Emits laser beams according to the image data.

Makes the laser scanning speeds at both ends of the drum same as each other.

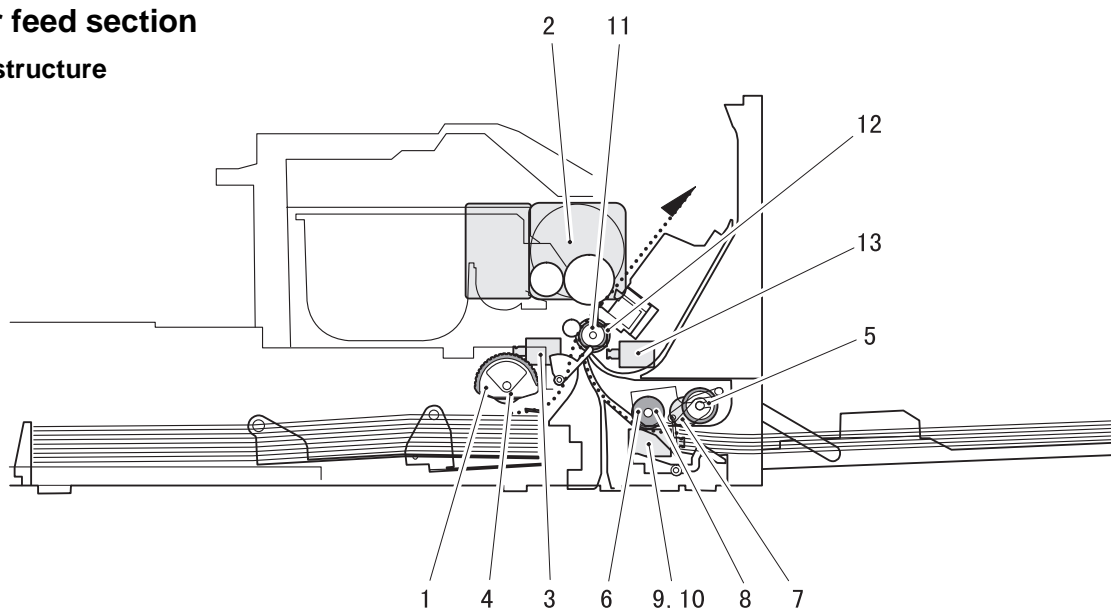


B. Laser beam path



5. Paper feed section

A. Basic structure



1	No. 1 cassette paper feed roller (Semi-circular roller)	Picks up paper from No. 1 cassette.
2	Main motor	Drives the process section and the paper transport section.
3	No. 1 cassette paper feed solenoid	Rotates and controls No. 1 cassette paper feed roller.
4	No. 1 cassette paper feed roller clutch	Drives No. 1 cassette paper feed roller.
5	Manual paper feed roller	Picks up paper from the manual paper feed tray.
6	Manual paper transport roller	Transport paper which was picked up from the manual paper feed tray.
7	Manual paper feed roller clutch	Drives the manual paper feed roller.
8	Manual paper transport roller clutch	Drives the manual paper transport roller.
9	Manual paper feed roller solenoid	Rotates and controls the manual paper feed roller.
10	Manual paper transport roller solenoid	Rotates and controls the manual paper transport roller.
11	Resist roller	Takes synchronization between the paper lead edge and the image lead edge.
12	Resist roller clutch	Drives the resist roller.
13	Resist roller solenoid	Rotates and controls the resist roller.

B. Brief descriptions of operations

This machine allows two ways of paper feed system: cassette paper feed and manual paper feed.

The cassette of universal type is employed to hold 250 sheets. The front loading system allows to attach or detach the cassette from the front of the machine.

Paper size can be selected by the user.

Since this model is not equipped with the automatic paper select function, paper size detection is not performed.

(1) Cassette paper feed operation

Select the cassette and press the START button, and the paper feed roller solenoid will be turned on and the paper feed clutch will be released.

The drive power of the main motor is transmitted through the paper feed roller clutch to the paper feed roller, rotating the paper feed roller and feeding paper.

(2) Manual paper feed tray operation

Select the manual paper feed tray and press the START button, and the manual paper feed roller will be turned on to bring the paper feed roller in contact with paper and lift the shutter simultaneously.

The drive power of the main motor is transmitted through the manual paper feed roller clutch to the manual paper feed roller, rotating the manual paper feed roller and feeding paper.

(3) Resist roller

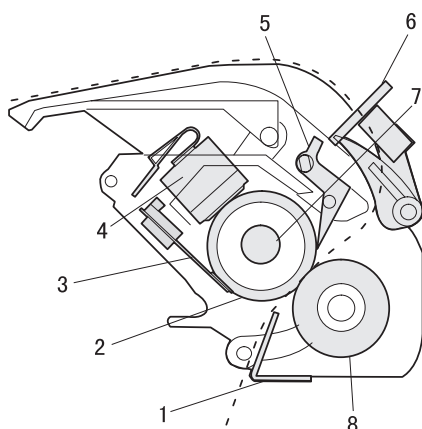
In order to make synchronization between the paper lead edge fed from the paper feed port and the image lead edge, the roller is kept stationary for a certain time after the paper reaches at the roller to warp the paper a little.

When the paper is warped to a certain level, the resist roller solenoid is turned on to release the resist roller clutch.

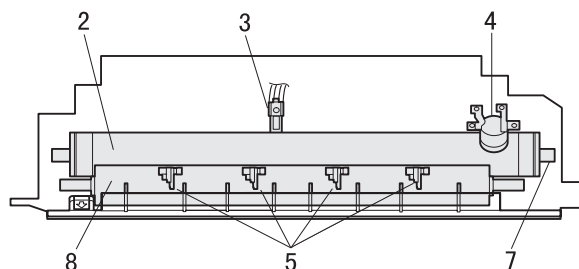
The drive power of the main motor is transmitted through the resist roller clutch to the resist roller, rotating the resist roller and feeding paper.

6. Fusing section

A. Basic composition



(Top view)



1	Before-fusing paper guide	Guides the paper transported from the process section to the fusing unit.
2	Upper heat roller	Applies heat and pressure to the paper to fuse.
3	Thermistor	Detects the surface temperature of the upper heat roller.
4	Thermostat	Stops power supply to the heat roller in case of an abnormally high temperature of the heat roller.
5	Separation pawl	Separates the print paper from the upper heat roller.
6	POD1	Detects that the paper has been transported from the fusing section.
7	Heater lamp	Heats the heat roller.
8	Lower heat roller	Applies a pressure to the paper together with the upper heat roller.

B. Heat roller

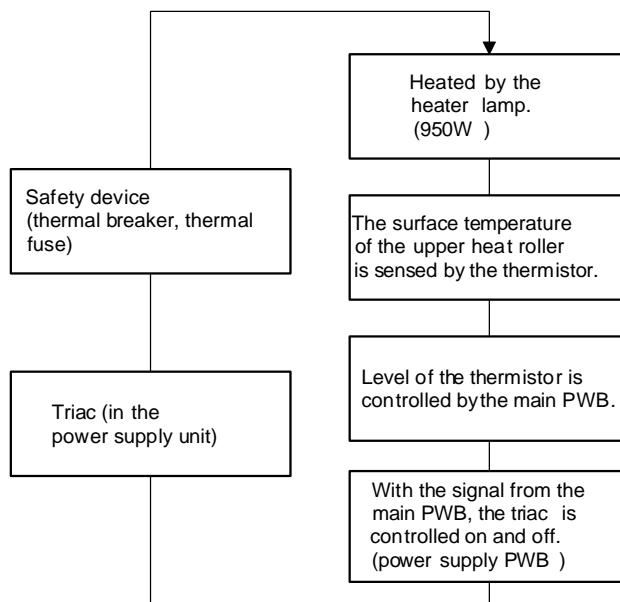
A pressure roller is used for the heat roller and a silicone rubber roller is used for the lower heat roller for better toner fusing performance and paper separation.

C. Separator pawl

Four separator pawls are used on the upper heat roller. The separator pawls are teflon coated to reduce friction with the roller and prevent a smear on the paper caused by the separator pawl.

D. Thermal control

- 1) The heater lamp, thermistor, main PWB, DC power supply PWB, and triac within the power supply unit are used to control the temperature in the fuser unit. To prevent against abnormally high temperature in the fuser unit, a thermostat is used for safety purposes.



- 2) The surface temperature of the upper heat roller is set to 180°C ~ 195°C. The surface temperature during the power save mode is set to 100°C.

- 3) The self-check function comes active when one of the following malfunctions occurs, and an "H" is displayed on the copy quantity display.

Fusing temperature error value

H4 (Low temperature error)

- During machine operation

The case where the fusing temperature (thermistor output value) does not reach 155°C within 55 sec from lighting of the heater lamp. (If the toner motor rotates for 10 sec or more continuously when starting the machine, the case where the fusing temperature does not reach 155°C within 60 sec.)

- During printing

When the fusing temperature (thermistor output value) falls below 145°C.

H3 (High temperature error)

Fusing temperature (thermistor output value) of about 220 to 240°C (varies depending on the resistance.)

E. Fusing resistor

(1) Fusing resistor

Since the upper heat roller is conductive when copy paper is highly moistured and the distance between the transfer unit and the fusing unit is short, the transfer current leaks through the copy paper, the upper heat roller and the discharging brush.

To prevent against this, a resistor of 150MΩ is provided between the frame and the discharge brush to minimize leak current and improve transfer efficiency.

[7] ADJUSTMENTS

1. Adjustment item list

Section		Adjustment item		Adjustment procedure/SIM No.	
A	Process section	(1)	Developing bias voltage output adjustment	SIM 8-1	
		(2)	Main charger voltage output adjustment	SIM 8-2/SIM 8-3	
		(3)	Transfer charger current adjustment	SIM 8-6	
B	Mechanism section	(1)	Image position adjustment	SIM 50-1/SIM 50-10	
		(2)	Main scanning direction (FR direction) distortion balance adjustment	No. 2/3 mirror base unit installing position adjustment	
				Copy lamp unit installing position adjustment	
		(3)	Main scanning direction (FR direction) distortion adjustment	F rail height adjustment	
		(4)	Sub scanning direction (scanning direction) distortion adjustment	Winding pulley position adjustment	
		(5)	Main scanning direction (FR direction) magnification ratio adjustment	SIM 48-1	
		(6)	Sub scanning direction (scanning direction) magnification ratio adjustment	a	OC mode in copying (SIM 48-2)
				b	SPF mode in copying (SIM 48-5)
		(7)	Off center adjustment	a	OC mode (SIM 50-13)
				b	SPF mode (SIM 50-16)
C	Image density adjustment	(8)	Document size detection sensor	SIM 41-2	
		(1)	Copy mode	SIM 46-1	

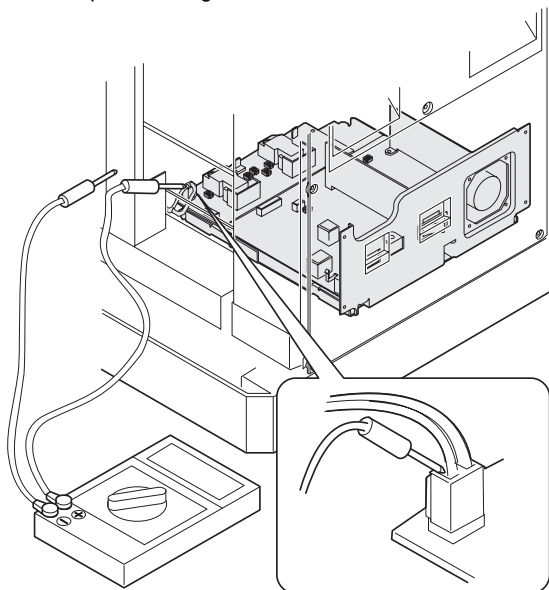
2. Copier adjustment

A. Process section

(1) Developing bias voltage adjustment (SIM 8-1)

Note: • Use a digital multi-meter with an internal resistance of 10M Ω or more.

- 1) Set the digital multi-meter range to DC700V.
- 2) Put the test rod of the digital multi-meter on the developing bias voltage output check pin.
- 3) Execute SIM 8-1. (The developing bias voltage is outputted for 30 sec.)
- 4) Adjust the adjustment volume VR31 so that the output voltage is within the specified range shown below.



<Adjustment specification>

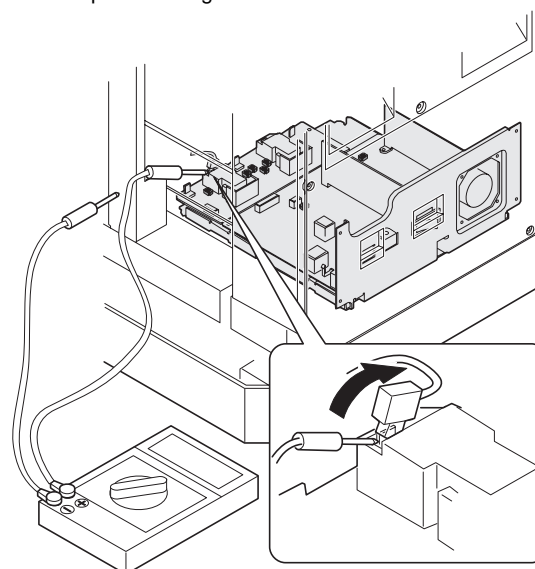
Mode	Specification	SIM	
Developing bias voltage	DC-400 \pm 8V	SIM 8-1	VR31

(2) Grid bias voltage adjustment (SIM 8-2, SIM 8-3)

Note: • Use a digital multi-meter with an internal resistance of 10M Ω or more.

- First adjust the grid LOW output, then adjust the grid HIGH voltage.

- 1) Set the digital multi-meter range to DC700V.
- 2) Put the test rod of the digital multi-meter on the grid bias voltage output check pin.
- 3) Execute SIM 8-3. (The grid bias voltage is outputted in the grid bias LOW output mode for 30 sec.)
- 4) Adjust the adjustment volume VR52 so that the output voltage is within the specified range shown below.
- 5) Execute SIM 8-2. (The grid bias voltage is outputted in the grid bias HIGH output mode for 30 sec.)
- 6) Adjust the adjustment volume VR51 so that the output voltage is within the specified range shown below.



<Adjustment specification>

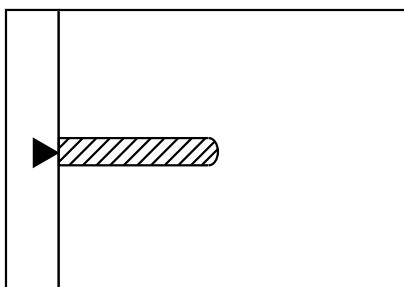
Mode	Specification	SIM	
Grid bias LOW	DC-400 \pm 20V	SIM 8-3	VR52
Grid bias HIGH	DC-525 \pm 10V	SIM 8-2	VR51

B. Mechanism section

(1) Image position adjustment (SIM 50-1/SIM 50-10)

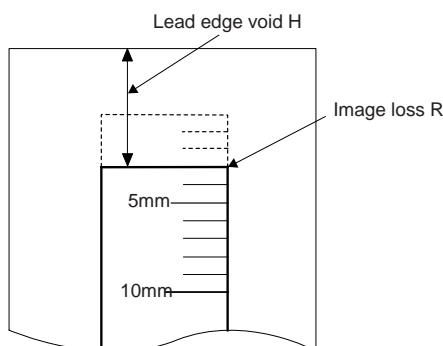
a. Image lead edge position adjustment

- 1) Set a scale on the document table as shown below.



- 2) Make a copy.
- 3) Check the copy. If, necessary, perform the following adjustment procedure.
- 4) Execute SIM 50-1. Set AE (Laser radiation timing)/Lead edge void value to 0. Make a copy (100%) again.
- 5) Set the laser radiation timing (image loss amount). Measure R in the figure below.
Laser radiation timing = R (mm) × 10
- 6) Set the lead edge void.
Measure H in the figure below.
Lead edge void = H(mm) × 10
- 7) Enter the set value and press the start key.
The correction value is stored and a copy is made.

(Example)

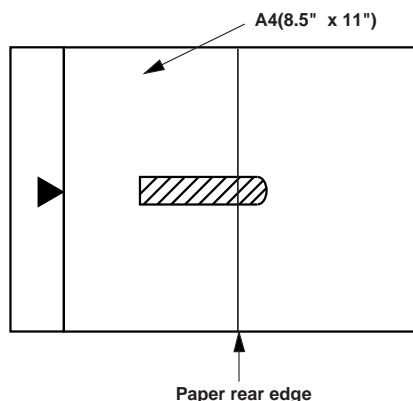


<Adjustment specification>

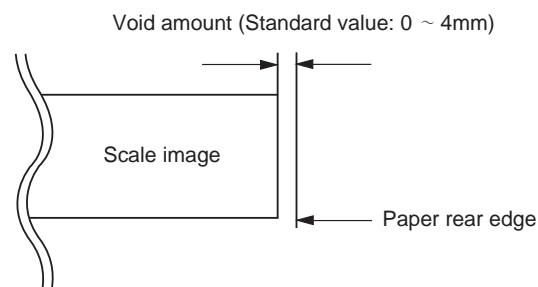
Mode	Specification	SIM	Set value	Set range
Laser radiation timing	1 ~ 4mm	SIM 45-1	1 step: 0.1mm shift	1 ~ 99
Lead edge void adjustment				

b. Rear edge void adjustment

- 1) Set a scale as shown in the figure below.



- 2) Set the document size to A4, and make two copies at 100%.
- 3) Check the second copy. If necessary, perform the following adjustment procedure.
* The first copy does not show the void. Be sure to check the second copy.



- 4) Execute SIM 50-1 and set the density mode to AE + TEXT + PHOTO (Rear edge void).
The currently set adjustment value is displayed.
- 5) Enter the set value and press the start key.
The correction value is stored and a copy is made.

<Adjustment specification>

Mode	Specification	SIM	Set value	Set range
Rear edge void	4mm or less	SIM 50-1	1 step: 0.1mm shift	1-99

c. Paper off center adjustment

- 1) Execute SIM 50-1 and set the density mode of Manual (TEXT) (Left edge void) to 0.
- 2) Set a test chart (UKOG-0089SCZZ) on the document table.
- 3) Select a paper feed port and make a copy.
Compare the copy and the test chart. If necessary, perform the following adjustment procedure.
- 4) Execute SIM 50-10.
After completion of warmup, shading is performed and the currently set off center adjustment value of each paper feed port is displayed.
- 5) Enter the set value and press the start key.
The correction value is stored and a copy is made.

<Adjustment specification>

Mode	Specification	SIM	Set value	Set range
Paper off center	Single: Center ±2.0mm	SIM 50-10	Add 1: 0.1mm shift to R side. Reduce 1: 0.1mm shift to L side.	1 ~ 99
	Duplex: Center ±2.5mm			

d. Left edge void area adjustment

Note: Before performing this adjustment, be sure to check that the paper off center adjustment (SIM 50-10) is completed.

- 1) Set a test chart (UKOG-0089SCZZ) on the document table.
- 2) Select a paper feed port and make two copies.
Compare the second copy and the test chart. If necessary, perform the following adjustment procedure.
* The first copy does not show the void. Be sure to check the second copy.
- 3) Execute SIM 50-1 and set the density mode to Manual (TEXT) (Left edge void).
The currently set adjustment value is displayed.
(When the off center adjustment previously described is performed, "0" is displayed.)
- 4) Enter the set value and press the start key.
The correction value is stored and a copy is made.

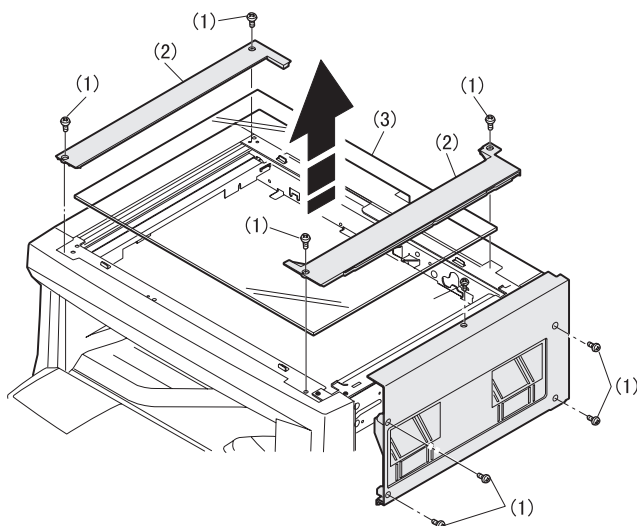
<Adjustment specification>

Mode	Specification	SIM	Set value	Set range
Left edge void	1 ~ 4mm	SIM 50-1	1 step: 0.1mm shift	1 ~ 99

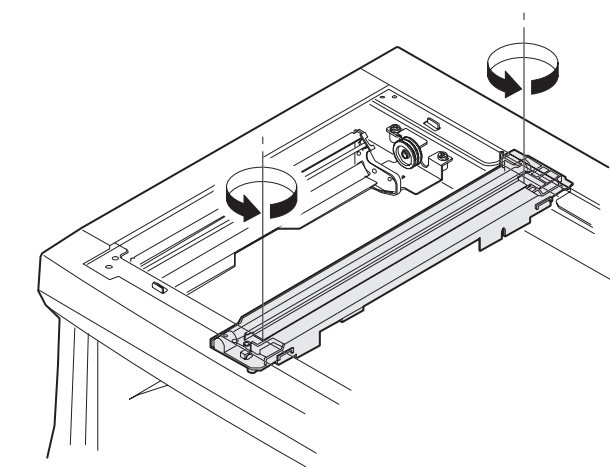
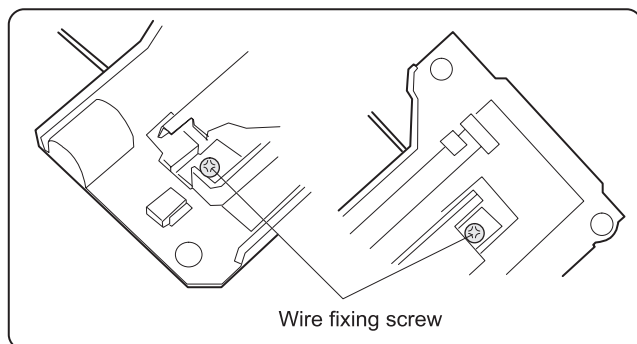
* When the left edge void is set with the paper off center adjusted, the both edge void is automatically adjusted.

(2) Main scanning direction (FR directional distortion balance adjustment)

- 1) Remove the OC glass and the right cabinet.



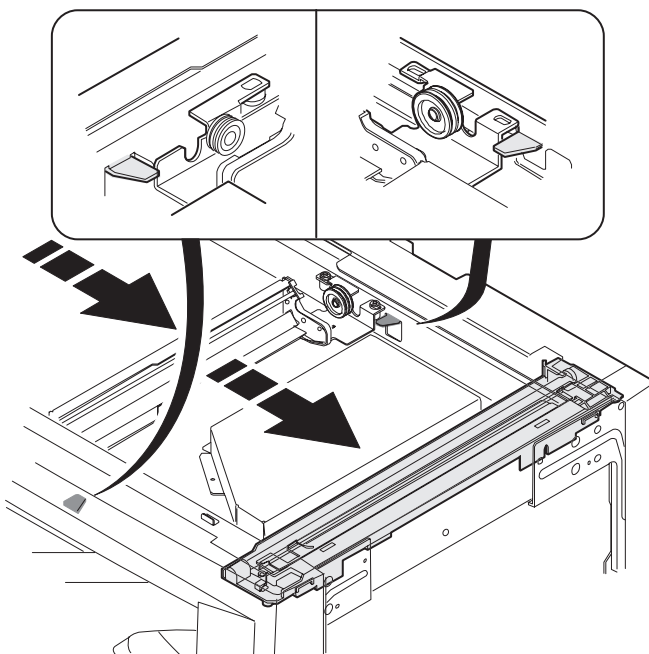
- 2) Loosen the copy lamp unit wire fixing screw.



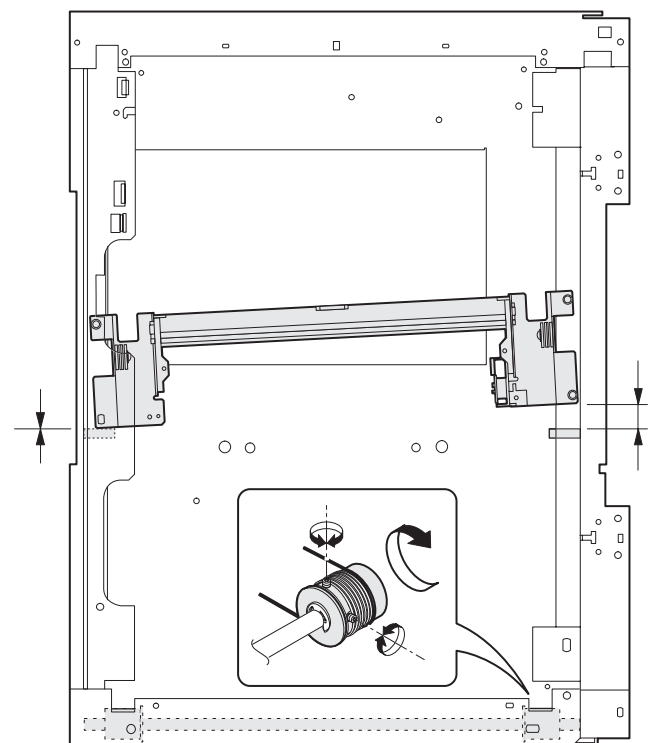
- 3) Manually turn the mirror base drive pulley and bring No. 2/3 mirror base unit into contact with the positioning plate.

At that time, if the front frame side and the rear frame side of No. 2/3 mirror base unit are brought into contact with the positioning plate at the same time, the mirror base unit parallelism is proper.

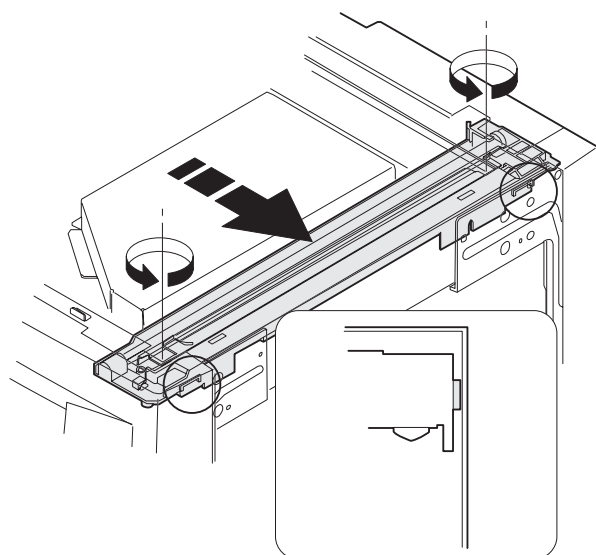
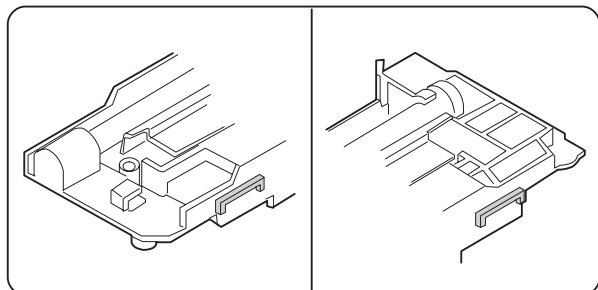
If one of them is in contact with the positioning plate, perform the adjustment of 4).



- 4) Loosen the set screw of the scanner drive pulley which is not in contact with No. 2/3 mirror base unit positioning plate.
- 5) Without moving the scanner drive pulley shaft, manually turn the scanner drive pulley until the positioning plate is brought into contact with No. 2/3 mirror base unit, then fix the scanner drive pulley.



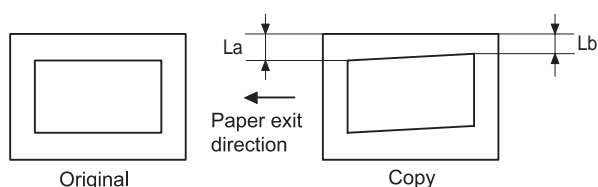
- 6) Put No. 2/3 mirror base unit on the positioning plate again, push the projections on the front frame side and the rear frame side of the copy lamp unit to the corner frame, and tighten the wire fixing screw.



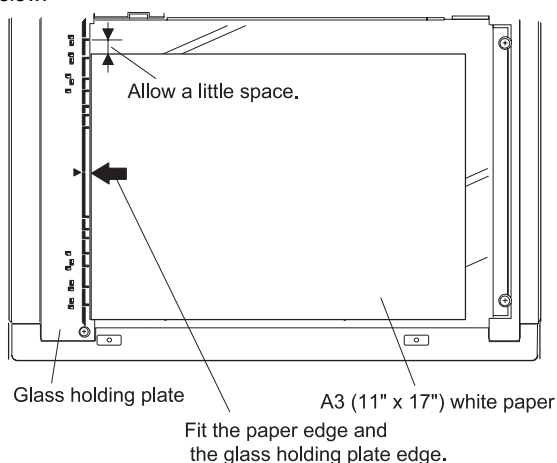
(3) Main scanning direction (FR direction) distortion adjustment

This adjustment must be performed in the following cases:

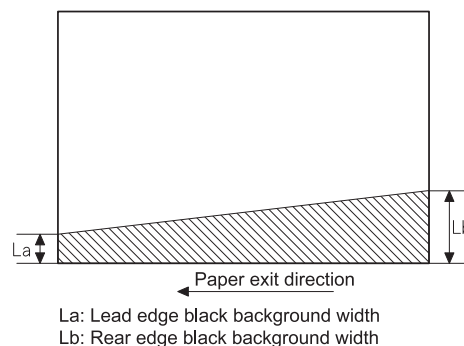
- When the mirror base drive wire is replaced.
- When the lamp unit, or No. 2/3 mirror holder is replaced.
- When a copy as shown is made.



- 1) Set A3 (11" x 17") white paper on the original table as shown below.

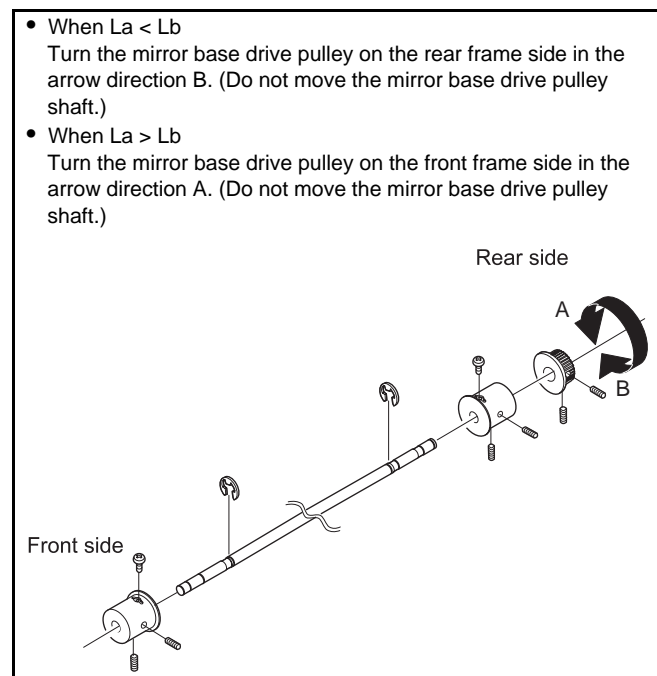


- 2) Open the original cover and make a normal (100%) copy.
3) Measure the width of the black background at the lead edge and at the rear edge.



If the width (La) of the black background at the lead edge is equal that (Lb) at the rear edge, there is no need to execute the following procedures of 4) ~ 7).

- 4) Loosen the mirror base drive pulley fixing screw on the front frame side or on the rear frame side.



- 5) Tighten the mirror base drive pulley fixing screw.

<Adjustment specification>

$La = Lb$

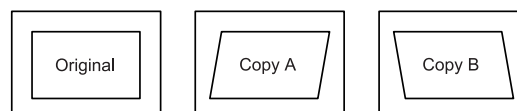
(4) Sub scanning direction (scanning direction) distortion adjustment

When there is no skew copy in the mirror base scanning direction and there is no horizontal error (right angle to the scanning direction), the adjustment can be made by adjusting the No. 2/3 mirror base unit rail height.

Before performing this adjustment, be sure to perform the horizontal image distortion adjustment in the laser scanner section.

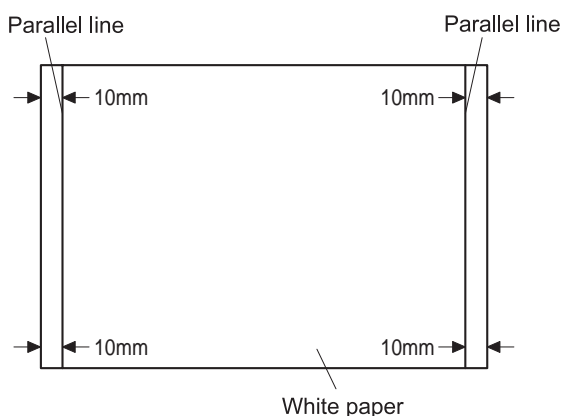
This adjustment must be performed in the following cases:

- When the mirror base wire is replaced.
- When the copy lamp unit or No. 2/3 mirror unit is replaced.
- When the mirror unit rail is replaced or moved.
- When a following copy is made.

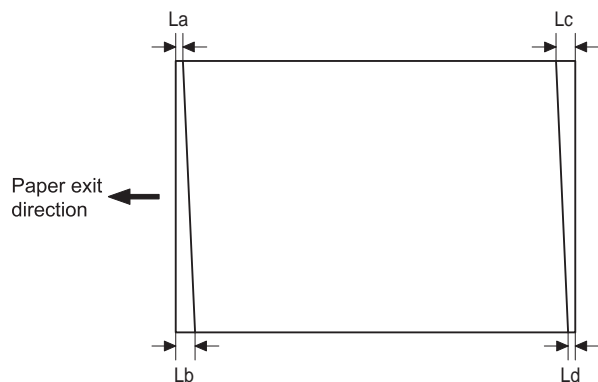


1) Making of a test sheet

Make test sheet by drawing parallel lines at 10mm from the both ends of A3 (11" x 17") white paper as shown below. (These lines must be correctly parallel to each other.)

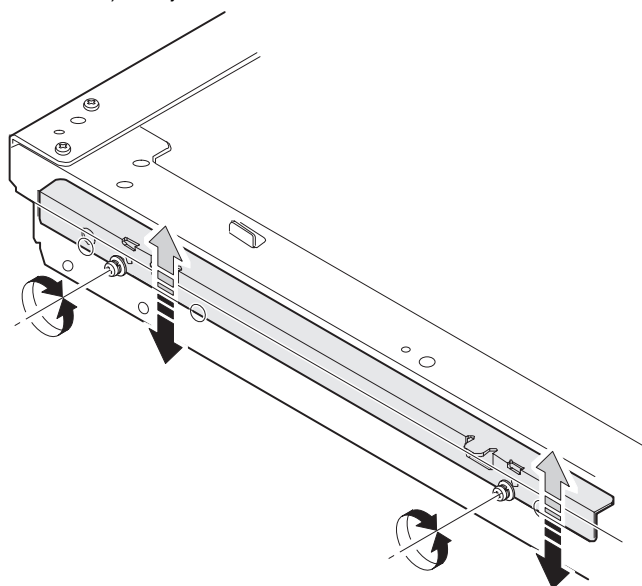


- 2) Make a normal (100%) copy of the test sheet on A3 (11" x 17") paper. (Fit the paper edge with the glass holding plate edge.)
- 3) Measure the distances (La, Lb, Lc, Ld) at the four corners as shown below.



When $La = Lb$ and $Lc = Ld$, no need to perform the procedures 4) and 5).

- 4) Move the mirror base B rail position up and down (in the arrow direction) to adjust.



- When $La > Lb$
Shift the mirror base B rail upward by the half of the difference of $La - Lb$.
- When $La < Lb$
Shift the mirror base B rail downward by the half of the difference of $Lb - La$.
Example: When $La = 12\text{mm}$ and $Lb = 9\text{mm}$, shift the mirror base B rail upward by 1.5mm.
- When $Lc > Ld$
Shift the mirror base B rail downward by the half of the difference of $Lc - Ld$.
- When $Lc < Ld$
Shift the mirror base B rail downward by the half of the difference of $Ld - Lc$.
- * When moving the mirror base rail, hold the mirror base rail with your hand.

<Adjustment specification>

$La = Lb, Lc = Ld$

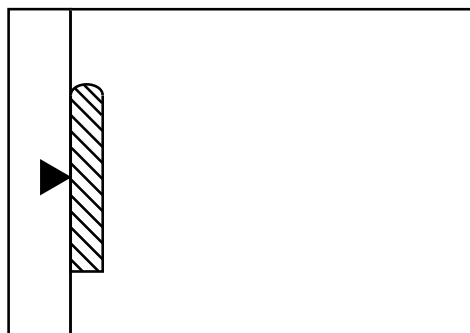
- 5) After completion of adjustment, manually turn the mirror base drive pulley, scan the mirror base A and mirror base B fully, and check that the mirror bases are not in contact with each other.

* If the mirror base rail is moved extremely, the mirror base may be in contact with the frame or the original glass. Be careful to avoid this.

(5) Main scanning direction (FR direction) magnification ratio adjustment (SIM 48-1)

Note: Before performing this adjustment, be sure to check that the CCD unit is properly installed.

- 1) Put a scale on the original table as shown below.



- 2) Execute SIM 48-1.
- 3) After warmup, shading is performed and the current set value of the main scanning direction magnification ratio is displayed on the display section in 2 digits.
- 4) Select the mode and press the start key again.
- 5) Auto correction mode (AE lamp ON)
The mirror unit moves to the shading position, and the reference width of the reference white plate is scanned, and the correction value is automatically calculated from that scanned value.
The correction value is displayed and a copy is made.
- 6) Compare the scale image and the actual scale.
If a fine adjustment is required, switch to the manual correction mode with the magnification ratio display key and perform fine adjustment.
- 7) Manual correction mode (TEXT lamp ON)
Enter the set value and press the start key.
The set value is stored and a copy is made.

<Adjustment specification>

Mode	Specification	SIM	Set value	Set range
Main scanning direction magnification ratio	At normal: $\pm 1.0\%$	SIM 48-1	Add 1: 0.1% increase Reduce 1: 0.1% decrease	1 ~ 99

- Error in the auto correction mode

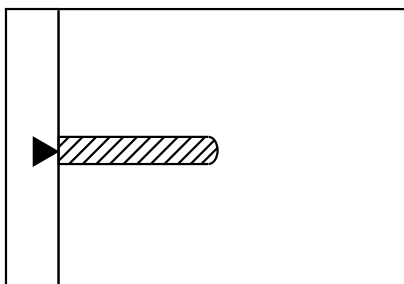
Display	Content	Major cause
Copy quantity display "--"	The correction value calculated is over 5%.	<ul style="list-style-type: none"> • Improper position of reference width line of the reference white plate • Improper installation of CCD unit
Paper jam lamp ON	Reference line scanning error	<ul style="list-style-type: none"> • Defective CCD • No reference white plate

(6) Sub scanning direction (scanning direction) magnification ratio adjustment (SIM 48-2, SIM 48-5)

a. OC mode in copying

Note: • Before performing this adjustment, be sure to check that the CCD unit is properly installed.

- 1) Put a scale on the original table as shown below, and make a normal (100%) copy.



- 2) Compare the scale image and the actual image. If necessary, perform the following adjustment procedures.
- 3) Execute SIM 48-2.
- 4) After warmup, shading is performed and the current set value of the sub scanning direction magnification ratio is displayed on the display section in 2 digits.
- 5) Enter the set value and press the start key.
The set value is stored and a copy is made.

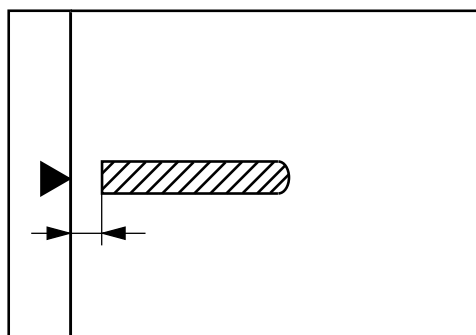
<Adjustment specification>

Mode	Specification	SIM	Set value	Set range
Sub scanning direction magnification ratio (OC mode)	Normal ±1.0%	SIM 48-2	Add 1: 0.1% increase Reduce 1: 0.1% decrease	1 ~ 99

b. SPF mode in copying

Note: • Before performing this adjustment, be sure to check that the CCD unit is properly installed.
• Before performing this adjustment, the OC mode adjustment in copying must be completed.

- 1) Put a scale on the original table as shown below, and make a normal (100%) copy to make a test chart.



Note: Since the printed copy is used as a test chart, put the scale in parallel with the edge lines.

- 2) Set the test chart on the SPF and make a normal (100%) copy.
- 3) Compare the scale image and the actual image. If necessary, perform the following adjustment procedures.
- 4) Execute SIM 48-5.
- 5) After warmup, shading is performed and the current set value of the sub scanning direction magnification ratio is displayed on the display section in 2 digits.
- 6) Enter the set value and press the start key.
The set value is stored and a copy is made.

<Adjustment specification>

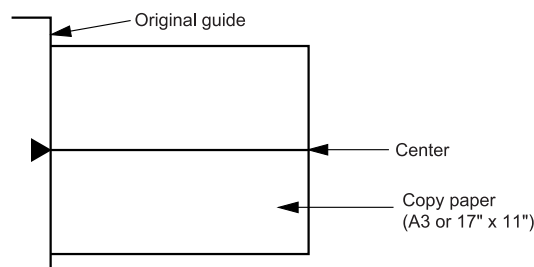
Mode	Specification	SIM	Set value	Set range
Sub scanning direction magnification ratio (SPF mode)	Normal ±1.0%	SIM 48-5	Add 1: 0.1% increase Reduce 1: 0.1% decrease	1 ~ 99

(7) Off center adjustment (SIM 50-13, SIM 50-16)

a. OC mode

Note: • Before performing this adjustment, be sure to check that the paper off center is properly adjusted. (SIM 50-10)

- 1) Make a test chart as shown below and set it so that its center line is fit with the original guide center mark.
* To make a test chart, draw a line on A3 or 11" x 17" paper at the center in the paper transport direction.



- 2) Make a normal copy from the manual paper feed tray, and compare the copy and the test chart.
If necessary, perform the following adjustment procedures.
- 3) Execute SIM 50-13.
- 4) After warmup, shading is performed and the current set value of the off center adjustment is displayed on the display section in 2 digits.
- 5) Enter the set value and press the start key.
The set value is stored and a copy is made.

<Adjustment specification>

Mode	Specification	SIM	Set value	Set range
Original off center mode (OC mode)	Single: Center ± 2.0mm	SIM 50-18	Add 1: 0.1mm shift to R side Reduce 1: 0.1mm shift to L side	1 ~ 99
	Duplex: Center ± 2.5mm			

b. SPF mode

Note: • Before performing this adjustment, be sure to check that the paper off center is properly adjusted.

- 1) Make a test chart for the center position adjustment and set it on the SPF.

<Adjustment specification>

Draw a line on a paper in the scanning direction.

- 2) Make a normal copy from the manual paper feed tray, and compare the copy and the original test chart.
If necessary, perform the following adjustment procedures.
- 3) Execute SIM 50-16.

- 4) After warmup, shading is performed and the current set value of the off center adjustment at each paper feed port is displayed on the display section in 2 digits.
- 5) Enter the set value and press the start key.
The set value is stored and a copy is made.

<Adjustment specification>

Mode	Specification	SIM	Set value	Set range
Original off center mode (SPF mode)	Single: Center $\pm 3.0\text{mm}$	SIM 50-16	Add 1: 0.1mm shift to R side	1 ~ 99
	Duplex: Center $\pm 3.5\text{mm}$		Reduce 1: 0.1mm shift to L side	

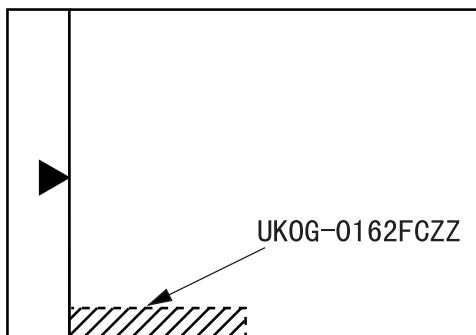
(8) Original sensor adjustment (SIM 43-3)

- 1) Execute SIM 41-2.
- 2) Set A3 (11" x 17") paper on the OC table.
- 3) Press the start key again.
- 4) The sensor level of the original sensor is automatically checked and the value with an original - 40 is made as the threshold value for scanning. (Automatic setting)
- 5) Execute SIM 43-3.
- 6) The light reception level of the original sensor is displayed.
The first digit of the copy quantity display shows "A": Light reception level display
The first digit of the copy quantity display shows "b": Original judgement level display
(The mode selection is made with the magnification ratio display key.)
- 7) By changing the paper set on the original table, the original size LED sensed by the sensor is lighted.

C. Image density adjustment

(1) Copy mode (SIM 46-1)

- 1) Set a test chart (UKOG-0162FCZZ) on the OC table as shown below.



- 2) Put several sheets of A3 or 11" x 17" white paper on the test chart.
- 3) Execute SIM 46-1.
- 4) After warmup, shading is performed and the current set value of the density level is displayed on the display section in 2 digits.
For mode selection, use the density select key.
- 5) Change the set value with the 10-key to adjust the copy image density.
- 6) Make a copy and check that the specification below is satisfied.

<Adjustment specification>

Density mode	Display lamp	Exposure level	Sharp Gray Chart output	Set value	Set range
Auto	Auto	—	"3" is slightly copied.	The greater the set value is, the greater the density is.	1 ~ 99
Manual	Manual	3	"3" is slightly copied.		
Photo	Photo	3	"3" is slightly copied.	The smaller the set value is, the smaller the density is.	
Toner save	Manual/Photo	3	"3" is slightly copied.		

[8] SIMULATION

1. Entering the simulation mode

Perform the following procedure to enter the simulation mode.

Clear key → Interruption key → Shift key → Interruption key → Start key → Sub code → Start key

2. Cancelling the simulation mode

When the all clear key is pressed, the simulation mode is cancelled.

When the interruption key is pressed, the process is interrupted and the screen returns to the sub code entering display.

3. List of simulations

Main code	Sub code	Contents
1	1	Mirror unit operation check
	2	Optical system sensor operation check
2	1	SPF aging
	2	SPF sensor operation check
	3	SPF motor forward rotation operation check
	4	SPF motor reverse rotation operation check
	8	SPF paper feed solenoid operation check
	9	SPF reverse solenoid operation check
	10	SPF paper exit gate solenoid operation check
	11	SPF PS release solenoid operation check
3	2	Shifter job separator sensor operation check
	3	Shifter operation check
	4	Job separator operation check
	10	Job separator home position check
5	1	Operation panel display check
	2	Heater lamp lighting check, cooling fan motor operation check
	3	Copy lamp lighting check
6	1	Paper feed solenoid operation check
	10	Main cassette paper feed roller drive
7	1	Aging with JAM with warmup time display
	2	Aging without JAM with warmup time display
	4	Warmup saving
	6	Intermittent aging (with paper)
	7	Intermittent aging (without paper)
	8	Warmup time display
8	1	Developing bias voltage output check
	2	Main charger voltage output check (Grid bias high mode)
	3	Main charger voltage output check (Grid bias low mode)
	6	Transfer charger voltage check
9	1	Duplex motor forward rotation operation check
	2	Duplex motor reverse rotation operation check
	4	Duplex motor rotation speed adjustment
	5	Duplex motor switchback time adjustment
10		Toner motor operation check
14		Trouble (except for U2) cancel
16		U2 trouble cancel
17		PF trouble cancel
20	1	Maintenance counter clear
21	1	Maintenance cycle setting
	2	Mini maintenance counter display
22	1	Maintenance counter display
	2	Maintenance preset value display

Main code	Sub code	Contents
22	3	JAM memory display
	4	Total JAM counter display
	5	Total counter display
	6	Developing counter display
	7	Developing preset counter value display
	8	SPF counter display
	9	Paper feed counter display
	12	Drum counter display
	14	Flash ROM version display
	15	Trouble memory display
	16	Duplex print counter display
	17	Copy counter display
	18	Printer counter display
	19	Electronic sort counter display
	20	FAX print counter display
	21	Scanner counter display
24	1	JAM memory, JAM counter clear
	2	Trouble memory clear
	4	SPF counter clear
	5	Duplex counter clear
	6	Paper feed counter clear
	7	Drum counter clear
	8	Copy counter clear
	9	Printer counter clear
	10	Electronic sort counter clear
	11	FAX print counter clear
	13	Scanner counter clear
25	1	Main motor operation check
	10	Polygon motor operation check
26	1	Operation switch display
	3	Auditor setting
	5	Counter mode setting
	6	Destination setting
	22	Language setting
	30	CE mark conformity control setting
30	1	Machine sensor operation check
41	2	OC document sensor adjustment
	3	Document sensor light reception level display
42	1	Developer counter clear
43	1	Fusing temperature setting
46	1	Copy density level adjustment
	2	FAX density level adjustment
48	1	Main scanning (front/rear) direction magnification ratio adjustment(Copy/FAX/OC-SPF common)
	2	OC mode sub scanning direction magnification ratio adjustment in copying
	5	SPF mode sub scanning direction magnification ratio adjustment in copying
	6	OC mode sub scanning direction magnification ratio adjustment in FAX
	7	SPF mode sub scanning direction magnification ratio adjustment in FAX
50	1	Copy image position adjustment
	10	Paper off center adjustment
	13	OC mode document off center adjustment
	16	SPF mode document off center adjustment
51	2	Resist amount adjustment
63	1	Shading data check
64	1	Self printing mode
69	1	Program download mode

4. Contents of simulations

Main code	Sub code	Contents	Details of operation	Initial value	Set range				
1	1	Mirror unit operation check	Used to execute scanning at the speed corresponding to the set magnification ratio. <table><tr><th>Key operation</th><th>Display</th></tr><tr><td>Changing the magnification ratio: Fixed magnification ratio key</td><td>Set magnification ratio: Fixed magnification ratio LED</td></tr></table>	Key operation	Display	Changing the magnification ratio: Fixed magnification ratio key	Set magnification ratio: Fixed magnification ratio LED	100%	50 ~ 200%
	Key operation	Display							
Changing the magnification ratio: Fixed magnification ratio key	Set magnification ratio: Fixed magnification ratio LED								
	2	Optical system sensor operation check	Used to check MHPS (Mirror home position sensor) ON/OFF state with the LED on the operation panel. <table><tr><th>Display</th></tr><tr><td><Lighting when the sensor is ON> MHPS: Paper empty LED</td></tr></table>	Display	<Lighting when the sensor is ON> MHPS: Paper empty LED				
Display									
<Lighting when the sensor is ON> MHPS: Paper empty LED									
2	1	SPF aging	Used to perform SPF document transport. The paper size is not detected. (Excluding postcards, extra large sheet of 1m or greater.) With SPF installed: Single transport operation With RSPF installed: Duplex transport operation						
	2	SPF sensor operation check	Used to check sensors in SPF with the LED on the operation panel. <table><tr><th>Display</th></tr><tr><td><Lighting at sensor ON> PW1: JAM LED PW2: Paper empty LED PW3: Machine position JAM LED PW4: SPF JAM LED PL1: Manual paper feed tray select LED PL2: Second cassette position JAM LED P-IN: SPF select LED P-OUT: Main cassette select LED</td></tr></table>	Display	<Lighting at sensor ON> PW1: JAM LED PW2: Paper empty LED PW3: Machine position JAM LED PW4: SPF JAM LED PL1: Manual paper feed tray select LED PL2: Second cassette position JAM LED P-IN: SPF select LED P-OUT: Main cassette select LED				
	Display								
	<Lighting at sensor ON> PW1: JAM LED PW2: Paper empty LED PW3: Machine position JAM LED PW4: SPF JAM LED PL1: Manual paper feed tray select LED PL2: Second cassette position JAM LED P-IN: SPF select LED P-OUT: Main cassette select LED								
	3	SPF motor forward rotation operation check	Used to rotate the SPF motor forward at the speed corresponding to the currently set magnification ratio for 10 sec. <table><tr><th>Key operation</th><th>Display</th></tr><tr><td>Magnification ratio change: Fixed magnification ratio key</td><td>Set magnification ratio: Fixed magnification ratio LED</td></tr></table>	Key operation	Display	Magnification ratio change: Fixed magnification ratio key	Set magnification ratio: Fixed magnification ratio LED	100%	50 ~ 200%
	Key operation	Display							
	Magnification ratio change: Fixed magnification ratio key	Set magnification ratio: Fixed magnification ratio LED							
	4	SPF motor reverse rotation operation check	Used to rotate the SPF motor reversely for 10 sec.						
	8	SPF paper feed solenoid operation check	Used to drive the SPF paper feed solenoid (PSOL) at the cycle of 500msec ON and 500msec OFF 20 times.						
	9	SPF reverse solenoid operation check	Used to drive the SPF reverse solenoid (RSOL) at the cycle of 500msec ON and 500msec OFF 20 times.						
	10	SPF paper exit gate solenoid operation check	Used to drive the SPF paper exit gate solenoid (GSOL) at the cycle of 500msec ON and 500msec OFF 20 times.						
11	SPF PS release solenoid operation check	Used to drive the SPF PS release solenoid at the cycle of 500msec ON and 500msec OFF 20 times.							
3	2	Shifter job separator sensor operation check	Used to check the sensors state in the shifter job separator with the LED on the operation panel. <table><tr><th>Display</th></tr><tr><td><Lighting at sensor ON> Shifter HP sensor: Machine position JAM LED Job separator HP sensor: SPF JAM LED Paper exit full sensor: Second cassette position JAM LED</td></tr></table>	Display	<Lighting at sensor ON> Shifter HP sensor: Machine position JAM LED Job separator HP sensor: SPF JAM LED Paper exit full sensor: Second cassette position JAM LED				
	Display								
<Lighting at sensor ON> Shifter HP sensor: Machine position JAM LED Job separator HP sensor: SPF JAM LED Paper exit full sensor: Second cassette position JAM LED									
	3	Shifter operation check	Used to drive the shifter motor at the speed of printing of A4 (8-1/2 × 11"). Pressing the start key or the clear all key moves the shifter to the home position. <table><tr><th>Key operation</th></tr><tr><td>The shifter is moved to the home position: Start key or clear all key</td></tr></table>	Key operation	The shifter is moved to the home position: Start key or clear all key				
Key operation									
The shifter is moved to the home position: Start key or clear all key									

Main code	Sub code	Contents	Details of operation	Initial value	Set range				
3	4	Job separator operation check	Used to drive the job separator one way. Pressing the clear key stops the job separator at the home position. <table><tr><td>Key operation</td></tr><tr><td>Stops at the home position: Clear all key</td></tr></table>	Key operation	Stops at the home position: Clear all key				
	Key operation								
Stops at the home position: Clear all key									
	10	Job separator home position check	Used to drive the job separator to the home position. Then it is shifted by the specified number of steps for check, and the position is made as the origin. It is shifted from the origin by the specified number of steps.						
5	1	Operation panel display check	Used to light all LED's on the operation panel for 5 sec.						
	2	Heater lamp lighting check, cooling fan motor operation check	Used to turn ON the heater lamp for 500msec and OFF for 500msec 5 times. At the same time, the cooling fan is rotated at a high speed. After checking the heater lamp operation, the cooling fan motor rotate at a low speed.						
	3	Copy lamp lighting check	Used to light the copy lamp for 5 sec. At that time, the copy lamp brightness can be changed with the density adjustment key. When this simulation is canceled, the copy lamp brightness if automatically adjusted. <table><tr><td>Key operation</td></tr><tr><td>Copy lamp brightness: Density adjustment key</td></tr></table>	Key operation	Copy lamp brightness: Density adjustment key				
Key operation									
Copy lamp brightness: Density adjustment key									
6	1	Paper feed solenoid operation check	When the start key is pressed, the selected paper feed solenoid is driven at the cycle of 500msec ON and 500msec OFF 20 times. <table><tr><th>Key operation</th><th>Display</th></tr><tr><td>Solenoid selection: Tray select button</td><td><Lighting at solenoid selection> Main cassette paper feed solenoid: Main cassette select LED Multi manual paper feed solenoid: Manual paper feed select LED No. 2 cassette paper feed solenoid: No. 2 cassette select LED No. 3 cassette paper feed solenoid: No. 3 cassette select LED No. 4 cassette paper feed solenoid: No. 4 cassette select LED Resist roller solenoid: Machine position JAM LED No. 2 cassette transport solenoid: No. 2 cassette position JAM LED No. 3 cassette transport solenoid: No. 3 cassette position JAM LED No. 4 cassette transport solenoid: No. 4 cassette position JAM LED Paper out 1 solenoid: Paper empty LED Paper out 2 solenoid: SPF JAM LED Paper out 3 solenoid: SPF select LED</td></tr></table>	Key operation	Display	Solenoid selection: Tray select button	<Lighting at solenoid selection> Main cassette paper feed solenoid: Main cassette select LED Multi manual paper feed solenoid: Manual paper feed select LED No. 2 cassette paper feed solenoid: No. 2 cassette select LED No. 3 cassette paper feed solenoid: No. 3 cassette select LED No. 4 cassette paper feed solenoid: No. 4 cassette select LED Resist roller solenoid: Machine position JAM LED No. 2 cassette transport solenoid: No. 2 cassette position JAM LED No. 3 cassette transport solenoid: No. 3 cassette position JAM LED No. 4 cassette transport solenoid: No. 4 cassette position JAM LED Paper out 1 solenoid: Paper empty LED Paper out 2 solenoid: SPF JAM LED Paper out 3 solenoid: SPF select LED		
	Key operation	Display							
Solenoid selection: Tray select button	<Lighting at solenoid selection> Main cassette paper feed solenoid: Main cassette select LED Multi manual paper feed solenoid: Manual paper feed select LED No. 2 cassette paper feed solenoid: No. 2 cassette select LED No. 3 cassette paper feed solenoid: No. 3 cassette select LED No. 4 cassette paper feed solenoid: No. 4 cassette select LED Resist roller solenoid: Machine position JAM LED No. 2 cassette transport solenoid: No. 2 cassette position JAM LED No. 3 cassette transport solenoid: No. 3 cassette position JAM LED No. 4 cassette transport solenoid: No. 4 cassette position JAM LED Paper out 1 solenoid: Paper empty LED Paper out 2 solenoid: SPF JAM LED Paper out 3 solenoid: SPF select LED								
	10	Main cassette paper feed roller drive	Used to rotate the paper feed roller of the main cassette one turn to face it downward.						
7	1	Aging with JAM with warmup time display	Used to start warmup and count and display the warmup time every second. After completion of warmup, count up is terminated and the ready lamp is lighted. When the clear key is pressed and the copy quantity is entered and the start key is pressed, copying is made to make the set quantity of copies. At that time, the paper size does not matter. <table><tr><td>Key operation</td></tr><tr><td>Copy quantity setting: Copy quantity key</td></tr></table>	Key operation	Copy quantity setting: Copy quantity key		1 ~ 9		
Key operation									
Copy quantity setting: Copy quantity key									

Main code	Sub code	Contents	Details of operation	Initial value	Set range
7	2	Aging without JAM with warmup time display	Used to start warmup and count and display the warmup time every second. After completion of warmup, count up is terminated and the ready lamp is lighted. When the clear key is pressed and the copy quantity is entered and the start key is pressed, copying is made to make the set quantity of copies. At that time, the paper size does not matter. <div> <div>Key operation</div> <div>Copy quantity setting: Copy quantity key</div> </div>		1 ~ 99
	4	Warmup saving	Used to bring the machine to the ready state without warmup.		
	6	Intermittent aging (with paper)	After completion of warmup, counting is stopped and the ready lamp is lighted. When the copy quantity is entered and the start key is pressed, copying is made to make the set quantity of copies. After 3 sec standby, copying is made again to make the set quantity of copies. After that this operation is repeated. The paper size does not matter. <div> <div>Key operation</div> <div>Copy quantity setting: Copy quantity key</div> </div>		1 ~ 99
	7	Intermittent aging (without paper)	After completion of warmup, counting is stopped and the ready lamp is lighted. When the copy quantity is entered and the start key is pressed, copying is made to make the set quantity of copies. After 3 sec standby, copying is made again to make the set quantity of copies. After that this operation is repeated. The paper size does not matter. <div> <div>Key operation</div> <div>Copy quantity setting: Copy quantity key</div> </div>		1 ~ 99
	8	Warmup time display	Used to count and display the warmup time from 0 at every second.		
8	1	Developing bias voltage output check	Used to output the developing bias for 30 sec. For the adjustment procedure of the developing bias, refer to the previous descriptions.		
	2	Main charger voltage output check (Grid bias high mode)	Used to output the main charger grid bias voltage at the high mode for 30 sec. For the adjustment procedure of the main charger grid bias voltage, refer to the previous descriptions.		
	3	Main charger voltage output check (Grid bias low mode)	Used to output the main charger grid bias voltage at the low mode for 30 sec. For the adjustment procedure of the main charger grid bias voltage, refer to the previous descriptions.		
	6	Transfer charger voltage check	Used to output the transfer charger voltage for 30 sec. For the adjustment procedure of the transfer charger voltage, refer to the previous descriptions.		
9	1	Duplex motor forward rotation operation check	Used to rotate the duplex motor forward for 30 sec.		
	2	Duplex motor reverse rotation operation check	Used to rotate the duplex motor reversely for 30 sec.		
	4	Duplex motor rotation speed adjustment	After completion of warmup, the ready lamp is lighted and the currently set duplex motor rotation speed set value is displayed. When the set value is entered and the start key is pressed, the set value is stored. <div> <div>Key operation</div> <div>Duplex motor rotation speed set value: Copy quantity key</div> </div>		
	5	Duplex motor switchback time adjustment	After completion of warmup, the ready lamp is lighted and the currently set duplex motor switchback time set value is displayed. When the set value is entered and the start key is pressed, the set value is stored. <div> <div>Key operation</div> <div>Duplex motor switchback time set value: Copy quantity key</div> </div>		
10		Toner motor operation check	Used to operate the toner motor for 30 sec. Note: If this simulation is executed with the toner hopper installed, toner is automatically supplied to the developer. Be careful of overtoner.		
14		Trouble (except for U2) cancel	Used to cancel troubles except for U2.		
16		U2 trouble cancel	Used to cancel U2 trouble.		
17		PF trouble cancel	Used to cancel PF trouble.		

Main code	Sub code	Contents	Details of operation	Initial value	Set range							
20	1	Maintenance counter clear	Used to clear the maintenance counter. *2									
21	1	Maintenance cycle setting	Used to display the currently set maintenance cycle at the numbers shown at right. When the set value is entered and the start key is pressed, the set value is stored. <table border="1"><thead><tr><th>Key operation/Display</th></tr></thead><tbody><tr><td>0: 2500 sheets</td></tr><tr><td>1: 5000 sheets</td></tr><tr><td>2: 15000 sheets</td></tr><tr><td>3: 30000 sheets</td></tr><tr><td>4: 150000 sheets</td></tr><tr><td>5: FREE (999999 sheets)</td></tr></tbody></table>	Key operation/Display	0: 2500 sheets	1: 5000 sheets	2: 15000 sheets	3: 30000 sheets	4: 150000 sheets	5: FREE (999999 sheets)		
	Key operation/Display											
0: 2500 sheets												
1: 5000 sheets												
2: 15000 sheets												
3: 30000 sheets												
4: 150000 sheets												
5: FREE (999999 sheets)												
	2	Mini maintenance counter display	Used to display the currently set mini maintenance cycle at the numbers shown at right. When the set value is entered and the start key is pressed, the set value is stored. <table border="1"><thead><tr><th>Key operation/Display</th></tr></thead><tbody><tr><td>0: 2500 sheets</td></tr><tr><td>1: 5000 sheets</td></tr><tr><td>2: 10000 sheets</td></tr><tr><td>3: FREE (999999 sheets)</td></tr></tbody></table>	Key operation/Display	0: 2500 sheets	1: 5000 sheets	2: 10000 sheets	3: FREE (999999 sheets)				
Key operation/Display												
0: 2500 sheets												
1: 5000 sheets												
2: 10000 sheets												
3: FREE (999999 sheets)												
22	1	Maintenance counter display	Used to display the current maintenance counter value. *1									
	2	Maintenance preset value display	Used to display the current maintenance preset value (set with SIM 21-1). *1									
	3	JAM memory display	Used to display a JAM generated during copying on the JAM position display on the operation panel. Max. 30 recent jams are stored. <table border="1"><thead><tr><th>Key operation</th><th>Display</th></tr></thead><tbody><tr><td>JAM history select: Magnification ratio key</td><td>The history number (1 ~ 30) is displayed on the display. The JAM position LED corresponding to the history number is lighted.</td></tr></tbody></table>	Key operation	Display	JAM history select: Magnification ratio key	The history number (1 ~ 30) is displayed on the display. The JAM position LED corresponding to the history number is lighted.					
	Key operation	Display										
	JAM history select: Magnification ratio key	The history number (1 ~ 30) is displayed on the display. The JAM position LED corresponding to the history number is lighted.										
	4	Total JAM counter display	Used to display the current total JAM counter value. *1									
	5	Total counter display	Used to display the current total counter value. *1									
	6	Developing counter display	Used to display the current developing unit counter value. *1									
	7	Developing preset counter value display	Used to display the current mini maintenance preset value (set with SIM 21-2). *1									
	8	SPF counter display	Used to display the current SPF counter value. *1									
	9	Paper feed counter display	Used to display the current paper feed counter value for each paper feed port. *1 <table border="1"><thead><tr><th>Key operation</th></tr></thead><tbody><tr><td>Paper feed port selection: Tray select key</td></tr></tbody></table>	Key operation	Paper feed port selection: Tray select key							
	Key operation											
Paper feed port selection: Tray select key												
12	Drum counter display	Used to display the current drum counter value. *1										
14	Flash ROM version display	Used to display the version number of the flash ROM of each PWB.										
15	Trouble memory display	Used to display the actually occurred trouble codes on the display on the operation panel. When the start key is pressed during the main code display, the sub code is displayed. Max. 20 recent trouble codes are stored <table border="1"><thead><tr><th>Key operation</th><th>Display</th></tr></thead><tbody><tr><td>Sub code display: Start key Trouble code history select: Magnification ratio display key</td><td>Hysteresis 1 → 10: The upper digit of display "A" ~ "J" lights up. Hysteresis 11 → 20: The upper digit of display "A: ~ "J" blinks. • Display without trouble code Main code: "--" Sub code: "00"</td></tr></tbody></table>	Key operation	Display	Sub code display: Start key Trouble code history select: Magnification ratio display key	Hysteresis 1 → 10: The upper digit of display "A" ~ "J" lights up. Hysteresis 11 → 20: The upper digit of display "A: ~ "J" blinks. • Display without trouble code Main code: "--" Sub code: "00"						
Key operation	Display											
Sub code display: Start key Trouble code history select: Magnification ratio display key	Hysteresis 1 → 10: The upper digit of display "A" ~ "J" lights up. Hysteresis 11 → 20: The upper digit of display "A: ~ "J" blinks. • Display without trouble code Main code: "--" Sub code: "00"											

*1: Each counter display method

To display 12345: 123 (0.75 sec) → Blank (0.35sec) → 456 (0.75 sec) → Blank (1.0 sec) → repetition

*2: Display after clearing each counter

000 (0.75 sec) → Blank (0.35sec) → 000 (0.75 sec) → Blank (1.05 sec) → Repetition

Main code	Sub code	Contents	Details of operation	Initial value	Set range						
22	16	Duplex print counter display	Used to display the current duplex print counter value. *1								
	17	Copy counter display	Used to display the current copy counter value. *1								
	18	Printer counter display	Used to display the current printer counter value. *1								
	19	Electronic sort counter display	Used to display the current electronic sort counter value. *1								
	20	FAX print counter display	Used to display the current FAX print counter value. *1								
	21	Scanner counter display	Used to display the current scanner counter value.								
24	1	JAM memory, JAM counter clear	Used to clear the JAM memory and the JAM counter. *2								
	2	Trouble memory clear	Used to clear the trouble memory. *2								
	4	SPF counter clear	Used to clear the SPF counter. *2								
	5	Duplex counter clear	Used to clear the duplex counter. *2								
	6	Paper feed counter clear	Used to clear the paper feed counter. *2								
	7	Drum counter clear	Used to clear the drum counter. *2								
	8	Copy counter clear	Used to clear the copy counter. *2								
	9	Printer counter clear	Used to clear the printer counter. *2								
	10	Electronic sort counter clear	Used to clear the electronic sort counter. *2								
	11	FAX print counter clear	Used to clear the FAX print counter. *2								
	13	Scanner counter clear	Used to clear the scanner counter.								
25	1	Main motor operation check	Used to drive the main motor for 30 sec. At that time, the cooling motor rotates at a low speed. When the developing unit is installed, the developing bias, the grid, and the main charger are driven. When the developing unit is not installed, only the main motor is driven.								
	10	Polygon motor operation check	Used to drive the polygon motor for 30 sec.								
26	1	Operation switch display	Used to display the installed option on the operation panel. (The LED corresponding to the installed option is lighted.) <table border="1"><thead><tr><th>Key operation</th><th>Display</th></tr></thead><tbody><tr><td>Display select:</td><td><Lighting with an option installed></td></tr><tr><td>Magnification ratio key</td><td>When "A" is displayed: Shifter: Paper empty LED Job separator: JAM LED SPF: SPF select LED RSPF: SPF JAM LED Dehumidifying heater: Main body JAM LED Simplex mode: Multi manual paper feed select LED When "B" is displayed: Cassette (2nd step): No. 2 cassette select LED Cassette (3rd step): No. 3 cassette select LED Cassette (4th step): No. 4 cassette select LED Memory installed: Paper empty LED FAX: JAM LED Printer: Main body JAM LED ERDH: Main cassette select LED 16CPM: SPF JAM LED 20CPM: SPF select LED Document sensor: Auto paper select LED</td></tr></tbody></table>	Key operation	Display	Display select:	<Lighting with an option installed>	Magnification ratio key	When "A" is displayed: Shifter: Paper empty LED Job separator: JAM LED SPF: SPF select LED RSPF: SPF JAM LED Dehumidifying heater: Main body JAM LED Simplex mode: Multi manual paper feed select LED When "B" is displayed: Cassette (2nd step): No. 2 cassette select LED Cassette (3rd step): No. 3 cassette select LED Cassette (4th step): No. 4 cassette select LED Memory installed: Paper empty LED FAX: JAM LED Printer: Main body JAM LED ERDH: Main cassette select LED 16CPM: SPF JAM LED 20CPM: SPF select LED Document sensor: Auto paper select LED		
	Key operation	Display									
Display select:	<Lighting with an option installed>										
Magnification ratio key	When "A" is displayed: Shifter: Paper empty LED Job separator: JAM LED SPF: SPF select LED RSPF: SPF JAM LED Dehumidifying heater: Main body JAM LED Simplex mode: Multi manual paper feed select LED When "B" is displayed: Cassette (2nd step): No. 2 cassette select LED Cassette (3rd step): No. 3 cassette select LED Cassette (4th step): No. 4 cassette select LED Memory installed: Paper empty LED FAX: JAM LED Printer: Main body JAM LED ERDH: Main cassette select LED 16CPM: SPF JAM LED 20CPM: SPF select LED Document sensor: Auto paper select LED										
3	Auditor setting	Used to display the current auditor setting with the numbers at right. After entering the set value, press the start key, and the set value is stored. <table border="1"><thead><tr><th>Key operation/Display</th></tr></thead><tbody><tr><td>0: Built-in auditor</td></tr><tr><td>1: Coin vendor</td></tr><tr><td>2: Others</td></tr></tbody></table>	Key operation/Display	0: Built-in auditor	1: Coin vendor	2: Others					
Key operation/Display											
0: Built-in auditor											
1: Coin vendor											
2: Others											

*1: Each counter display method

To display 12345: 123 (0.75 sec) → Blank (0.35sec) → 456 (0.75 sec) → Blank (1.0 sec) → repetition

*2: Display after clearing each counter

000 (0.75 sec) → Blank (0.35sec) → 000 (0.75 sec) → Blank (1.05 sec) → Repetition

Main code	Sub code	Contents	Details of operation	Initial value	Set range																										
26	5	Counter mode setting	<p>Used to set the print counter mode in A3 or 11" × 17". Used to display the currently set counter value with the numbers at right. After entering the set value, press the start key, and the set value is stored.</p> <table border="1"><thead><tr><th colspan="2">Key operation/Display</th></tr></thead><tbody><tr><td>0: Total/Developer = 2 counts</td><td>Maintenance = 2 counts</td></tr><tr><td>1: Total/Developer = 1 count</td><td>Maintenance = 2 counts</td></tr><tr><td>2: Total/Developer = 2 counts</td><td>Maintenance = 1 count</td></tr><tr><td>3: Total/Developer = 1 count</td><td>Maintenance = 1 count</td></tr></tbody></table>	Key operation/Display		0: Total/Developer = 2 counts	Maintenance = 2 counts	1: Total/Developer = 1 count	Maintenance = 2 counts	2: Total/Developer = 2 counts	Maintenance = 1 count	3: Total/Developer = 1 count	Maintenance = 1 count																		
Key operation/Display																															
0: Total/Developer = 2 counts	Maintenance = 2 counts																														
1: Total/Developer = 1 count	Maintenance = 2 counts																														
2: Total/Developer = 2 counts	Maintenance = 1 count																														
3: Total/Developer = 1 count	Maintenance = 1 count																														
	6	Destination setting	<p>Used to display the current destination setting with the numbers at right. After entering the set value, press the start key, and the set value is stored.</p> <table border="1"><thead><tr><th colspan="2">Key operation/Display</th></tr></thead><tbody><tr><td colspan="2">0: Japan</td></tr><tr><td colspan="2">1: USA (Inch series)</td></tr><tr><td colspan="2">2: Canada (Inch series)</td></tr><tr><td colspan="2">3: Germany (AB series)</td></tr><tr><td colspan="2">4: UK (AB series)</td></tr><tr><td colspan="2">5: Australia (AB series)</td></tr><tr><td colspan="2">6: France (AB series)</td></tr><tr><td colspan="2">7: EX inch series</td></tr><tr><td colspan="2">8: EX AB series</td></tr><tr><td colspan="2">9: EX inch series (FC conformity)</td></tr><tr><td colspan="2">10: EX AB series (FC conformity)</td></tr><tr><td colspan="2">11: Taiwan, China (AB series)</td></tr></tbody></table>	Key operation/Display		0: Japan		1: USA (Inch series)		2: Canada (Inch series)		3: Germany (AB series)		4: UK (AB series)		5: Australia (AB series)		6: France (AB series)		7: EX inch series		8: EX AB series		9: EX inch series (FC conformity)		10: EX AB series (FC conformity)		11: Taiwan, China (AB series)			
Key operation/Display																															
0: Japan																															
1: USA (Inch series)																															
2: Canada (Inch series)																															
3: Germany (AB series)																															
4: UK (AB series)																															
5: Australia (AB series)																															
6: France (AB series)																															
7: EX inch series																															
8: EX AB series																															
9: EX inch series (FC conformity)																															
10: EX AB series (FC conformity)																															
11: Taiwan, China (AB series)																															
	22	Language setting	<p>Used to display the current setting of the language information with the number at right. After entering the set value, press the start key, and the set value is stored.</p> <table border="1"><thead><tr><th colspan="2">Key operation/Display</th></tr></thead><tbody><tr><td colspan="2">0: Japanese</td></tr><tr><td colspan="2">1: English</td></tr><tr><td colspan="2">2: French</td></tr><tr><td colspan="2">3: German</td></tr><tr><td colspan="2">4: Italian</td></tr><tr><td colspan="2">5: Dutch</td></tr><tr><td colspan="2">6: Swedish</td></tr><tr><td colspan="2">7: Spanish</td></tr></tbody></table>	Key operation/Display		0: Japanese		1: English		2: French		3: German		4: Italian		5: Dutch		6: Swedish		7: Spanish											
Key operation/Display																															
0: Japanese																															
1: English																															
2: French																															
3: German																															
4: Italian																															
5: Dutch																															
6: Swedish																															
7: Spanish																															
	30	CE mark conformity control setting	<p>Used to display the current setting of CE mark conformity control with the number at right. After entering the set value, press the start key, and the set value is stored.</p> <table border="1"><thead><tr><th colspan="2">Key operation/Display</th></tr></thead><tbody><tr><td colspan="2">0: CE mark control OFF</td></tr><tr><td colspan="2">1: CE mark control ON</td></tr></tbody></table>	Key operation/Display		0: CE mark control OFF		1: CE mark control ON																							
Key operation/Display																															
0: CE mark control OFF																															
1: CE mark control ON																															
30	1	Machine sensor operation check	<p>Used to check the sensors in the machine transport system with LED on the operation panel.</p> <table border="1"><thead><tr><th colspan="2">Display</th></tr></thead><tbody><tr><td colspan="2"><Lighting at sensor ON></td></tr><tr><td colspan="2">Paper entry sensor: Machine position JAM LED</td></tr><tr><td colspan="2">Duplex sensor: SPF JAM LED</td></tr><tr><td colspan="2">Paper exit sensor: JAM LED</td></tr><tr><td colspan="2">No. 2 cassette transport sensor: No. 2 cassette position JAM LED</td></tr><tr><td colspan="2">No. 3 cassette transport sensor: No. 3 cassette position JAM LED</td></tr><tr><td colspan="2">No. 4 cassette transport sensor: No. 4 cassette position JAM LED</td></tr></tbody></table>	Display		<Lighting at sensor ON>		Paper entry sensor: Machine position JAM LED		Duplex sensor: SPF JAM LED		Paper exit sensor: JAM LED		No. 2 cassette transport sensor: No. 2 cassette position JAM LED		No. 3 cassette transport sensor: No. 3 cassette position JAM LED		No. 4 cassette transport sensor: No. 4 cassette position JAM LED													
Display																															
<Lighting at sensor ON>																															
Paper entry sensor: Machine position JAM LED																															
Duplex sensor: SPF JAM LED																															
Paper exit sensor: JAM LED																															
No. 2 cassette transport sensor: No. 2 cassette position JAM LED																															
No. 3 cassette transport sensor: No. 3 cassette position JAM LED																															
No. 4 cassette transport sensor: No. 4 cassette position JAM LED																															
41	2	OC document sensor adjustment	<p>Used to read the document sensor input value with paper and perform the sensor detection level adjustment. For the adjustment procedure of the document sensor input value, refer to the previous descriptions.</p>																												

Main code	Sub code	Contents	Details of operation	Initial value	Set range								
41	3	Document sensor light reception level display	<div>Used to display the light reception level and the detection level of the document sensor. (The sensor level adjusted with SIM 41-2 is displayed.)</div> <table><tr><th>Key operation</th><th>Display</th></tr><tr><td>Light reception/Detection level select: Magnification ratio display key</td><td>Display at the 3rd digit "A": Light reception level display "b": Document detection level lighting LED</td></tr><tr><td>Sensor select: Magnification ratio select key</td><td>Sensor A: A3 document size LED Sensor B: A4 document size LED Sensor C: A4R document size LED Sensor D: B4 document size LED</td></tr></table>	Key operation	Display	Light reception/Detection level select: Magnification ratio display key	Display at the 3rd digit "A": Light reception level display "b": Document detection level lighting LED	Sensor select: Magnification ratio select key	Sensor A: A3 document size LED Sensor B: A4 document size LED Sensor C: A4R document size LED Sensor D: B4 document size LED				
Key operation	Display												
Light reception/Detection level select: Magnification ratio display key	Display at the 3rd digit "A": Light reception level display "b": Document detection level lighting LED												
Sensor select: Magnification ratio select key	Sensor A: A3 document size LED Sensor B: A4 document size LED Sensor C: A4R document size LED Sensor D: B4 document size LED												
42	1	Developer counter clear	Used to clear the developer counter. *2										
43	1	Fusing temperature setting	<div>Used to display the current setting of the fusing temperature with the number at right. After selecting the fusing temperature with the magnification ratio display key, press the start key, and the set value is stored.</div> <table><tr><th>Key operation</th></tr><tr><td>Fusing temperature select: Magnification ratio display key</td></tr></table>	Key operation	Fusing temperature select: Magnification ratio display key								
Key operation													
Fusing temperature select: Magnification ratio display key													
46	1	Copy density level adjustment	<div>After completion of warmup, shading is performed and the currently set copy density level is displayed. For the adjustment procedure, refer to the previous descriptions.</div> <table><tr><th>Key operation</th><th>Display</th></tr><tr><td>Mode select: Mode select key</td><td><LED lighting at each mode selection> Auto mode: AE LED Manual mode: TEXT LED Photo mode: PHOTO LED Toner save mode: TEXT/PHOTO LED</td></tr></table>	Key operation	Display	Mode select: Mode select key	<LED lighting at each mode selection> Auto mode: AE LED Manual mode: TEXT LED Photo mode: PHOTO LED Toner save mode: TEXT/PHOTO LED		1 ~ 99				
Key operation	Display												
Mode select: Mode select key	<LED lighting at each mode selection> Auto mode: AE LED Manual mode: TEXT LED Photo mode: PHOTO LED Toner save mode: TEXT/PHOTO LED												
	2	FAX density level adjustment	<div>After completion of warmup, shading is performed and the currently set FAX density level is displayed. For the adjustment procedure, refer to the previous descriptions.</div> <table><tr><th>Key operation</th><th>Display</th></tr><tr><td>Mode select: Mode select key</td><td><LED lighting at each mode selection> Standard mode: Standard LED Small character mode: Small character LED Fine mode: Fine LED Ultra fine mode: Ultra fine LED Photo mode: Photo LED</td></tr></table>	Key operation	Display	Mode select: Mode select key	<LED lighting at each mode selection> Standard mode: Standard LED Small character mode: Small character LED Fine mode: Fine LED Ultra fine mode: Ultra fine LED Photo mode: Photo LED		1 ~ 99				
Key operation	Display												
Mode select: Mode select key	<LED lighting at each mode selection> Standard mode: Standard LED Small character mode: Small character LED Fine mode: Fine LED Ultra fine mode: Ultra fine LED Photo mode: Photo LED												
48	1	Main scanning (front/rear) direction magnification ratio adjustment (Copy/FAX/OC-SPF common)	<div>After completion of warmup, shading is performed and the currently set main scanning (front/rear) direction magnification ratio adjustment is performed. For the adjustment procedure, refer to the previous descriptions.</div> <table><tr><th>Key operation</th><th>Display</th></tr><tr><td>Adjustment mode select: Magnification ratio key</td><td>Auto magnification ratio adjustment: AE LED</td></tr><tr><td>Manual main scanning direction magnification ratio adjustment</td><td>Manual magnification ratio adjustment: TEXT LED</td></tr><tr><td>Set value: Copy quantity key</td><td></td></tr></table>	Key operation	Display	Adjustment mode select: Magnification ratio key	Auto magnification ratio adjustment: AE LED	Manual main scanning direction magnification ratio adjustment	Manual magnification ratio adjustment: TEXT LED	Set value: Copy quantity key			1 ~ 99
Key operation	Display												
Adjustment mode select: Magnification ratio key	Auto magnification ratio adjustment: AE LED												
Manual main scanning direction magnification ratio adjustment	Manual magnification ratio adjustment: TEXT LED												
Set value: Copy quantity key													

*1: Each counter display method

To display 12345: 123 (0.75 sec) → Blank (0.35sec) → 456 (0.75 sec) → Blank (1.0 sec) → repetition

*2: Display after clearing each counter

000 (0.75 sec) → Blank (0.35sec) → 000 (0.75 sec) → Blank (1.05 sec) → Repetition

Main code	Sub code	Contents	Details of operation	Initial value	Set range				
48	2	OC mode sub scanning direction magnification ratio adjustment in copying	After completion of warmup, shading is performed and the currently set OC mode sub scanning direction magnification ratio adjustment in copying is performed. For the adjustment procedure, refer to the previous descriptions. <table border="1"><tr><td colspan="2">Key operation</td></tr><tr><td colspan="2">OC mode sub scanning direction copy magnification ratio in copying: Copy quantity key</td></tr></table>	Key operation		OC mode sub scanning direction copy magnification ratio in copying: Copy quantity key			1 ~ 99
	Key operation								
	OC mode sub scanning direction copy magnification ratio in copying: Copy quantity key								
	5	SPF mode sub scanning direction magnification ratio adjustment in copying	After completion of warmup, shading is performed and the currently set OC mode sub scanning direction magnification ration adjustment in copying is performed. For the adjustment procedure, refer to the previous descriptions. <table border="1"><tr><td colspan="2">Key operation</td></tr><tr><td colspan="2">SPF mode sub scanning direction magnification ratio in copying: Copy quantity key</td></tr></table>	Key operation		SPF mode sub scanning direction magnification ratio in copying: Copy quantity key			1 ~ 99
Key operation									
SPF mode sub scanning direction magnification ratio in copying: Copy quantity key									
6	OC mode sub scanning direction magnification ratio adjustment in FAX	After completion of warmup, shading is performed and the currently set OC mode sub scanning direction magnification ratio adjustment in FAX is performed. For the adjustment procedure, refer to the previous descriptions. <table border="1"><tr><td colspan="2">Key operation</td></tr><tr><td colspan="2">OC mode sub scanning direction magnification ratio in FAX: Copy quantity key</td></tr></table>	Key operation		OC mode sub scanning direction magnification ratio in FAX: Copy quantity key			1 ~ 99	
Key operation									
OC mode sub scanning direction magnification ratio in FAX: Copy quantity key									
7	SPF mode sub scanning direction magnification ratio adjustment in FAX	After completion of warmup, shading is performed and the currently set SPF mode sub scanning direction magnification ratio in FAX is performed. For the adjustment procedure, refer to the previous descriptions. <table border="1"><tr><td colspan="2">Key operation</td></tr><tr><td colspan="2">SPF mode sub scanning direction magnification ratio in FAX: Copy quantity key</td></tr></table>	Key operation		SPF mode sub scanning direction magnification ratio in FAX: Copy quantity key			1 ~ 99	
Key operation									
SPF mode sub scanning direction magnification ratio in FAX: Copy quantity key									
50	1	Copy image position adjustment	After completion of warmup, shading is performed and the currently set value is displayed. For the adjustment procedure, refer to the previous descriptions. <table border="1"><tr><th>Key operation</th><th>Display</th></tr><tr><td>Adjustment mode select: Exposure mode select key Set value: 10-key</td><td>Auto: Laser radiation timing adjustment Manual: Lead edge void adjustment Photo: Left edge void adjustment Auto + Manual + Photo: Rear edge void adjustment</td></tr></table>	Key operation	Display	Adjustment mode select: Exposure mode select key Set value: 10-key	Auto: Laser radiation timing adjustment Manual: Lead edge void adjustment Photo: Left edge void adjustment Auto + Manual + Photo: Rear edge void adjustment		1 ~ 99
	Key operation	Display							
Adjustment mode select: Exposure mode select key Set value: 10-key	Auto: Laser radiation timing adjustment Manual: Lead edge void adjustment Photo: Left edge void adjustment Auto + Manual + Photo: Rear edge void adjustment								
10	Paper off center adjustment	After completion of warmup, shading is performed and the currently set off center adjustment of each paper feed port is displayed. For the adjustment procedure, refer to the previous descriptions. <table border="1"><tr><th>Key operation</th><th>Display</th></tr><tr><td>Paper feed port tray select: Paper select key Off center adjustment value: Copy quantity key</td><td>Main cassette: Main cassette select LED Manual paper feed: Manual feed select LED No. 2 cassette: No. 2 cassette select LED No. 3 cassette: No. 3 cassette select LED No. 4 cassette: No. 4 cassette select LED</td></tr></table>	Key operation	Display	Paper feed port tray select: Paper select key Off center adjustment value: Copy quantity key	Main cassette: Main cassette select LED Manual paper feed: Manual feed select LED No. 2 cassette: No. 2 cassette select LED No. 3 cassette: No. 3 cassette select LED No. 4 cassette: No. 4 cassette select LED			
Key operation	Display								
Paper feed port tray select: Paper select key Off center adjustment value: Copy quantity key	Main cassette: Main cassette select LED Manual paper feed: Manual feed select LED No. 2 cassette: No. 2 cassette select LED No. 3 cassette: No. 3 cassette select LED No. 4 cassette: No. 4 cassette select LED								

Main code	Sub code	Contents	Details of operation	Initial value	Set range		
50	13	OC mode document off center adjustment	<p>After completion of warmup, shading is performed and the currently set off center adjustment value for the document in OC reading is displayed. For the adjustment procedure, refer to the previous descriptions.</p> <table><tr><td>Key operation</td></tr><tr><td>Off center adjustment value: Copy quantity key</td></tr></table>	Key operation	Off center adjustment value: Copy quantity key		
	Key operation						
Off center adjustment value: Copy quantity key							
	16	SPF mode document off center adjustment	<p>After completion of warmup, shading is performed and the currently set off center adjustment value for the document in SPF reading is displayed. For the adjustment procedure, refer to the previous descriptions.</p> <table><tr><td>Key operation</td></tr><tr><td>Off center adjustment value: Copy quantity key</td></tr></table>	Key operation	Off center adjustment value: Copy quantity key		
Key operation							
Off center adjustment value: Copy quantity key							
51	2	Resist amount adjustment	<p>After completion of warmup, shading is performed and the currently set resist amount adjustment value is displayed.</p> <table><tr><td>Key operation</td></tr><tr><td>Resist amount adjustment: Copy quantity key</td></tr></table>	Key operation	Resist amount adjustment: Copy quantity key		
Key operation							
Resist amount adjustment: Copy quantity key							
63	1	Shading data check	<p>The copy lamp is shifted to the shading position and it is lighted with the reference voltage at AD conversion fixed ($V_{ref-} = 0.5V$, $V_{ref+} = 4.5V$). This state is kept for 10 sec, and the level of one pixel at the center is displayed for each second.</p> <table><tr><td>Display</td></tr><tr><td>Display section: Shading data</td></tr></table>	Display	Display section: Shading data		
Display							
Display section: Shading data							
64	1	Self printing mode	<p>Disregards the optical system and performs self printing in 1 by 2 mode.</p> <table><tr><td>Key operation</td></tr><tr><td>Copy quantity setting: Copy quantity key</td></tr></table>	Key operation	Copy quantity setting: Copy quantity key		
Key operation							
Copy quantity setting: Copy quantity key							
69	1	Program download mode	<p>When entering this mode, the machine in the download mode and accepts no key entry. When the power is turned off, the download mode is cleared.</p>				

[9] USER PROGRAM

The factory setting can be changed according to the operating conditions.






1. User program functions

Function	Outline	Default
Auto clear	When a certain time is passed after completion of the machine operation, the mode is returned to the initial state automatically. The time to return to the initial state can be set in the range of 30 ~ 120 sec by the unit of 30 sec. This function can be canceled.	60 sec
Pre-heat	When the machine is left unused with the power ON, the power consumption level is automatically lowered to about 60Wh (*1). The time to operate this function can be set in the range of 30 sec ~ 120 sec by the unit of 30 sec. This function can be canceled. When this function operates, the pre-heat lamp on the operation panel lights up. To cancel the pre-heat state, press any key on the operation panel. (When the START key is pressed, pre-heat is canceled and copying is started.) This function is canceled with the document is set or the tray is pulled out.	90 sec
Auto power shut off passing time	When the machine is left unused with the power ON, the power consumption is automatically lowered to about 4.8Wh (*1). The time to operate this function can be set in the range of 30 min to 240 min. When this function operates, all the lamps except for the pre-heat lamp turn off. To cancel the auto power shut off state, press the START key.	30 min
Stream feeding mode (with SPF/R-SPF installed)	The auto power shut off function can be canceled.	Limited

*1: The power consumption in pre-heat, auto power shut off depends on the operating conditions.

2. Setting change procedure

Example: Changing the time for operating the auto clear function (from 60 sec to 120 sec)

- Press and hold the density adjustment key  for 5 sec to start setting.
 - When     lamps start blinking at the same time, and the copy quantity display shows "--" the digit of 10 blinking.
- Select the function code with the copy quantity set key.
 - The code of the selected function is displayed (blinking) on the digits of 10 and 100.
 - For auto clear, select 1.
 - Select the suitable code according to the table below.

User program setting contents

Function	Function code	Setting code
Auto clear	1	0 (Cancel)
		1 (30 sec)
		*2 (60 sec)
		3 (90 sec)
		4 (120 sec)
Pre-heat	2	0(Cancel)
		1 (30 sec)
		2 (60 sec)
		*3 (90 sec)
		4 (120 sec)
Auto power shut off passing time (*1)	3	*1 (30 sec)
		2 (to sec)
		3 (90 sec)
		4 (120 sec)
		5 (240 sec)
Auto power shut off function setting (*1)	5	0 (Cancel)
		*1 (Setting)

*: Factory setting

*1: With the auto power shut off canceled (function code "5", set code "0", auto power shut off time setting code "3"), the mode enters the auto power shut off setting mode automatically.

- The selected key number is displayed on the digit of 1 on the copy quantity display.






Cancel: When a wrong number is entered, press the clear key and enter the correct number.

- Press the START key.
 - The selected function code is changed from blinking to lighting.
 - The currently set code is displayed (blinking) on the digit of 1.
- Select the setting code with the copy quantity set key.
 - To set to "90 sec", select ③.
 - Refer to the setting code list in "User Program setting content" for setting.

Cancel: When a wrong function code is selected, press the clear key and repeat procedures from 2).

- Press the START key,
 - The selected setting code is changed from blinking to lighting. The setting is done with the above.

Memo: To set another function, press the clear key and repeat from procedure 2).

- Press the density adjustment key  to complete setting.
 - The lamps     are turned off and the copy quantity display returns to the normal display.

[10] TROUBLE CODE LIST

Classification	Function	Main code	Sub code	Trouble name	Remark
Electrical system error	Copier	H2	00	Thermistor open error	Thermistor is open
		H3	00	Fusing temperature abnormality (Abnormally high temperature detection)	Abnormally high fusing temperature
		H4	00	Fusing temperature abnormality (Abnormally low temperature detection)	Abnormally low fusing temperature
		CC		Media sensor error	Document detection error
		U2	04	EEPROM communication error	EEPROM abnormality
			11	Counter SAM error	EEPROM counter area SAM abnormality
			12	Adjustment value SAM error	EEPROM adjustment value memory area SAM abnormality
		F5	02	Copy lamp error	Copy lamp disconnection
	FAX	F6	00	FAX board communication trouble	
			10	FAX board trouble	
			80	FAX board communication trouble (Protocol)	
			81	FAX board communication trouble (Parity)	
			82	FAX board communication trouble (Overrun)	
			84	FAX board communication trouble (Framing)	
			88	FAX board communication trouble (Timeout)	
	Printer	F9	00	Printer board communication trouble	
			10	Printer board trouble	
			80	Printer board communication trouble (Protocol)	
			81	Printer board communication trouble (Parity)	
			82	Printer board communication trouble (Overrun)	
			84	Printer board communication trouble (Framing)	
			88	Printer board communication trouble (Timeout)	
	Electronic sort	E1	00	Electronic sort board communication trouble	
			10	Electronic sort board trouble	
			11	ASIC error	ASIC abnormality
			12	Image compression error	JBIG IC abnormality
			13	Flash ROM error	Program ROM abnormality
			14	RAM error	Work RAM abnormality
			15	Page memory error	Print buffer abnormality
			16	SIMM error	Compression storing memory abnormality
			17	Image rotating RAM error	Rotating RAM abnormality
			80	Electronic sort board communication trouble (Protocol)	
			81	Electronic sort board communication trouble (Parity)	
			82	Electronic sort board communication trouble (Overrun)	
			84	Electronic sort board communication trouble (Framing)	
			88	Electronic sort board communication trouble (Timeout)	

Classification	Function	Main code	Sub code	Trouble name	Remark
Electrical system error	Operation	U9	00	Operation board communication trouble	
			80	Operation board communication trouble (Protocol)	
			81	Operation board communication trouble (Parity)	
			82	Operation board communication trouble (Overrun)	
			84	Operation board communication trouble (Framing)	
			88	Operation board communication trouble (Timeout)	
	Zero cross	L8	01	Zero cross trouble	
Optical system error	CCD	E7	04	CCD white level trouble	CCD white level abnormality
			05	CCD black level trouble	CCD black level abnormality
			12	Shading trouble	White correction is not completed with the specified number of operations
	LSU	E7	03	LSU trouble	LSU abnormality
Mechanical system error	Mirror motor	U3	29	Mirror home position error	
		L1	00	Mirror feed trouble	
		L3	00	Mirror return trouble	
	Main motor	L4	01	Main motor lock	
	LSU	L6	10	Polygon motor trouble	
	Shifter	F1	06	Shifter motor trouble	
	Job separator	L4	10	Job separator motor trouble	Job separator function
Others	Operation	U95		Operation connection abnormality	Panel individual display caused by abnormal panel connection

[11] DISASSEMBLY AND ASSEMBLY

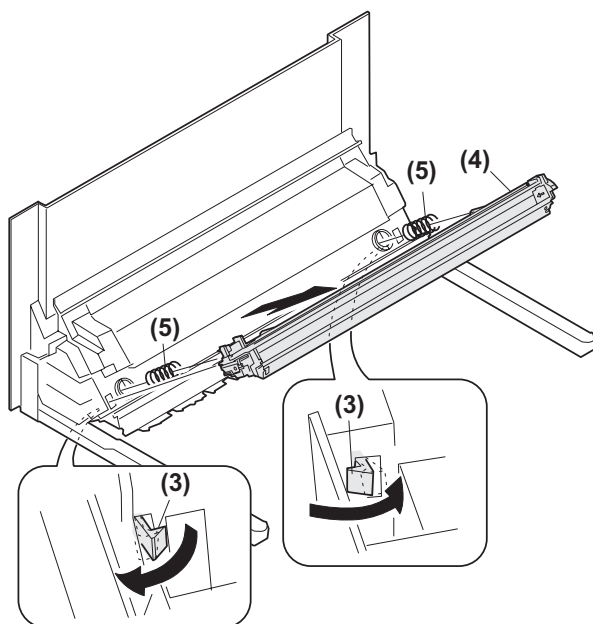
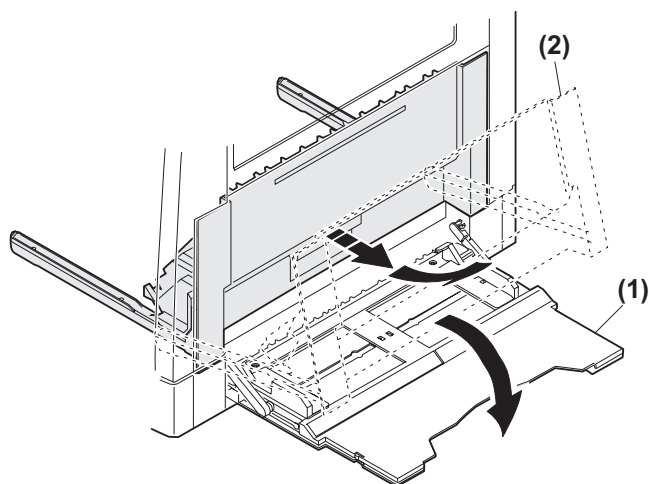
WARNING: Before performing the disassembly procedure, be sure to remove the power cord to prevent against an electric shock.

No.	Item	Page
1	High voltage section	11-1
2	Optical section	11-1
3	Fusing section	11-2
4	Paper exit section	11-4
5	MCU	11-6
6	Optical frame unit	11-6
7	LSU	11-6
8	Tray paper feed section/Paper transport section	11-7
9	Manual multi paper feed section	11-8
10	Power section	11-10

1. High voltage section

No.	Content
A	Transfer charger unit
B	Charger wire

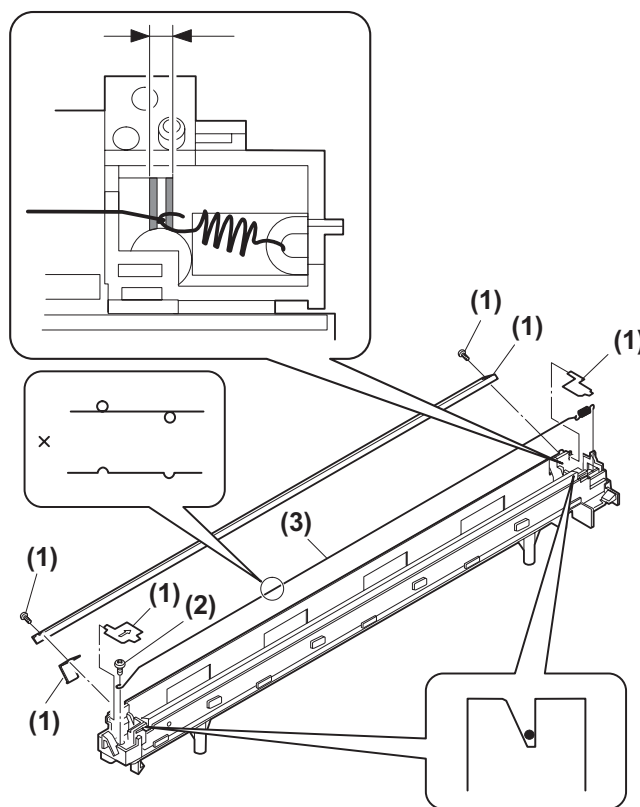
A. Transfer charger unit



B. Charger wire

Installation: The spring tip must be between two reference ribs.

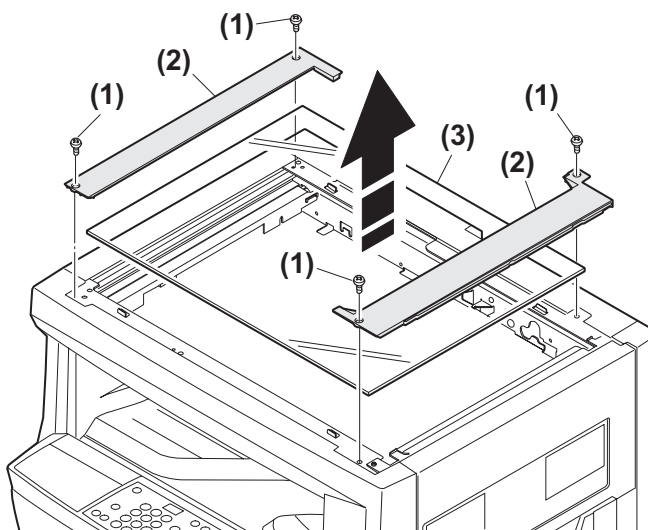
- The charger wire must be free from twist or bending.
- Be sure to put the charger wire in the V groove.



2. Optical section

No.	Content
A	Table glass
B	Copy lamp unit
C	Copy lamp
D	Lens unit

A. Table glass

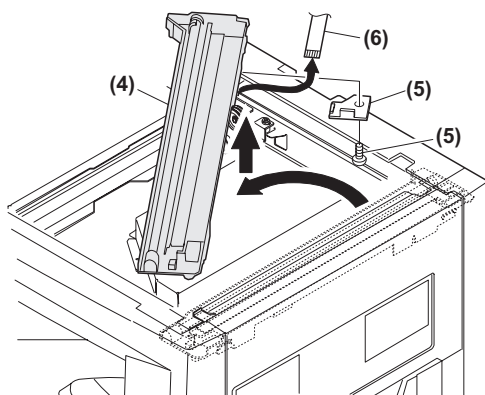
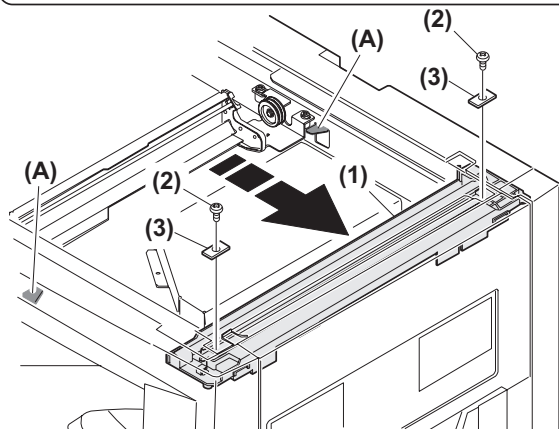
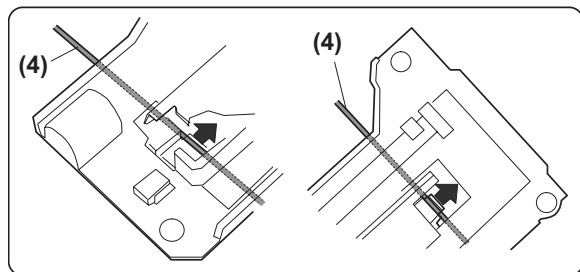


B. Copy lamp unit

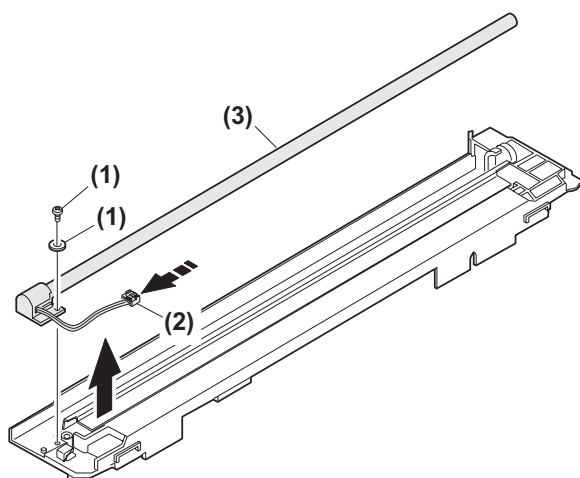
Disassembly: Be sure to put No. 2/3 mirror unit to the positioning plate (A).

Assembly: Put the notched surface of wire holder (3) downward, tighten temporarily, and install.

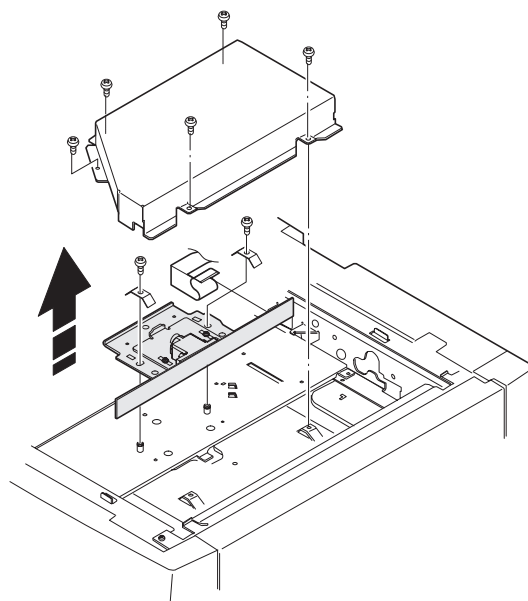
Adjustment: Main scanning direction distortion balance adjustment



C. Copy lamp



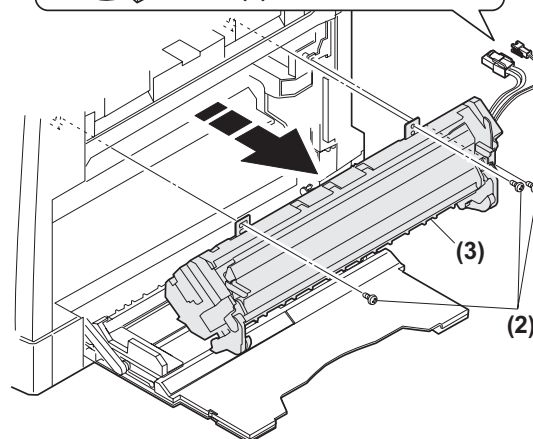
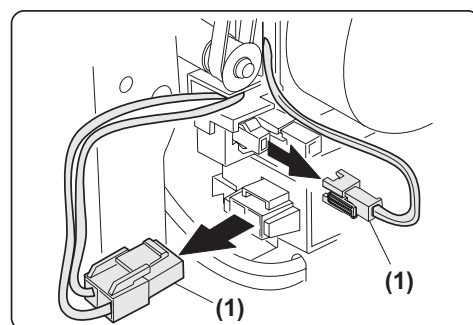
D. Lens unit



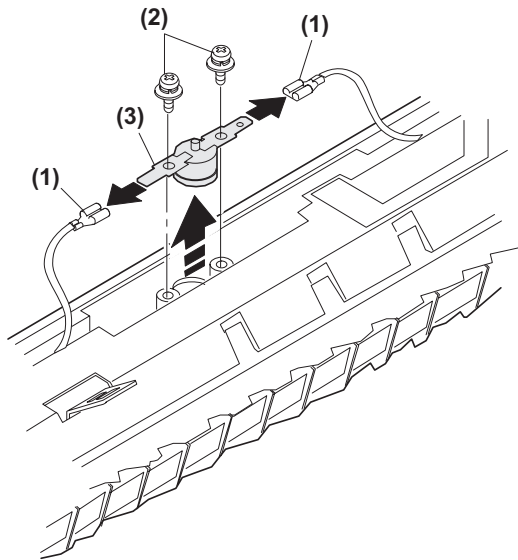
3. Fusing section

No.	Contents
A	Fusing unit
B	Thermostat
C	Thermistor
D	Heater lamp
E	Upper heat roller
F	Separation pawl
G	Lower heat roller

A. Fusing unit

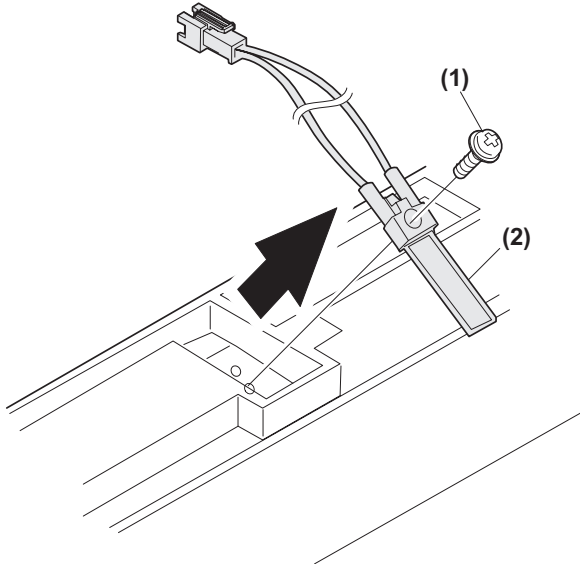


B. Thermostat



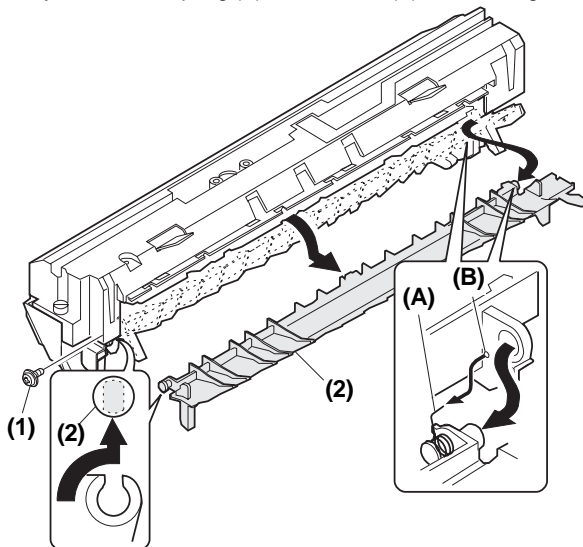
C. Thermistor

Installation: Check that the thermistor is in contact with the upper heat roller.

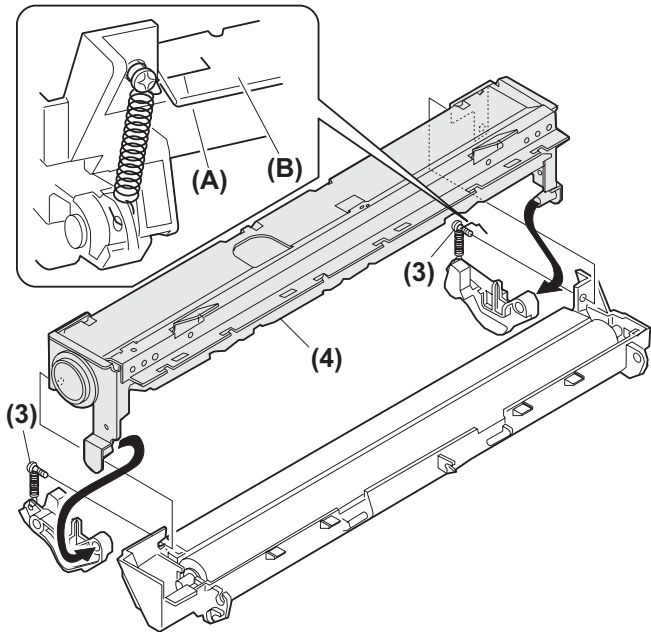


D. Heater lamp

Assembly: Insert the spring (A) into the hole (B) in the fusing frame.

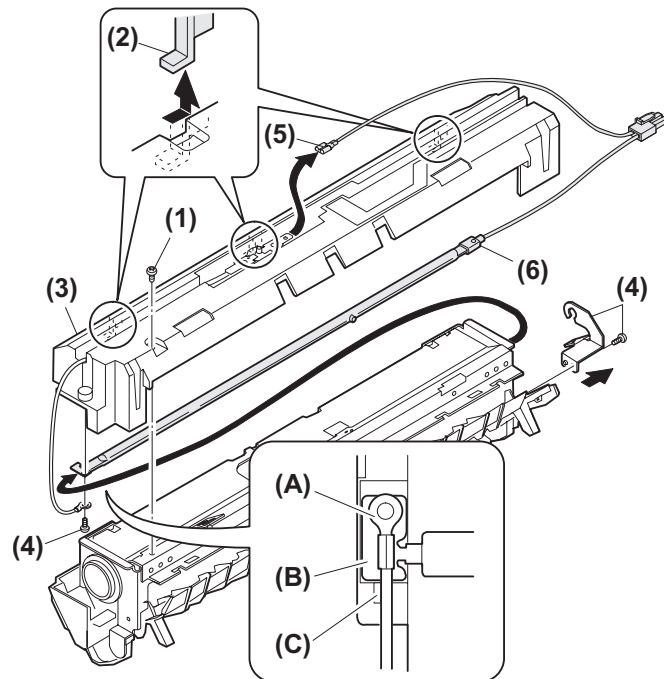


Assembly: Put the paper guide earth spring (A) under the paper guide (B) before fusing.



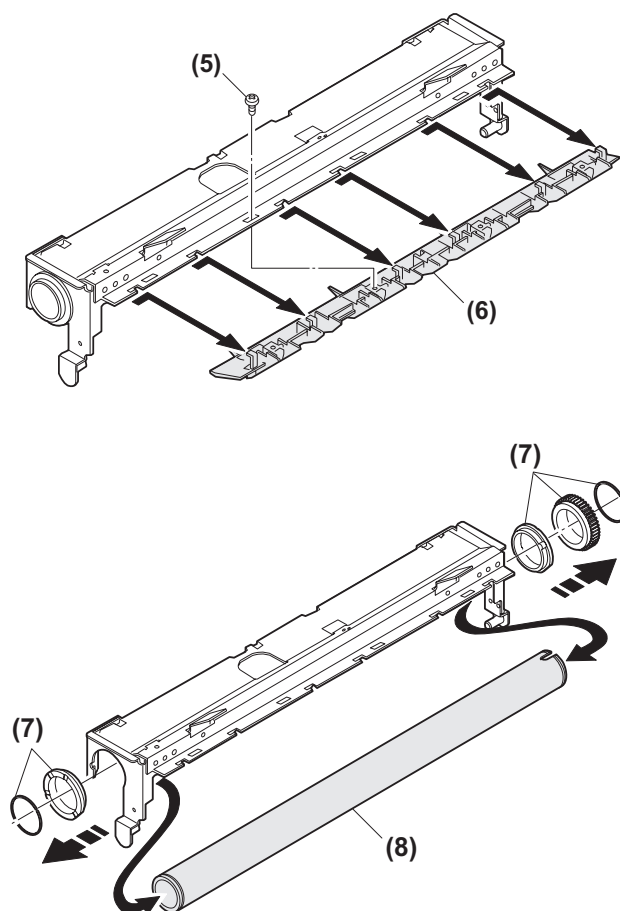
Disassembly: There are three pawls on the fusing cover. Remove the screws and slide the fusing cover to the right to remove.

The heater lamp is fixed on the fusing cover with a screw. Slide the fusing cover to the front and remove the screw, then remove the heater lamp.

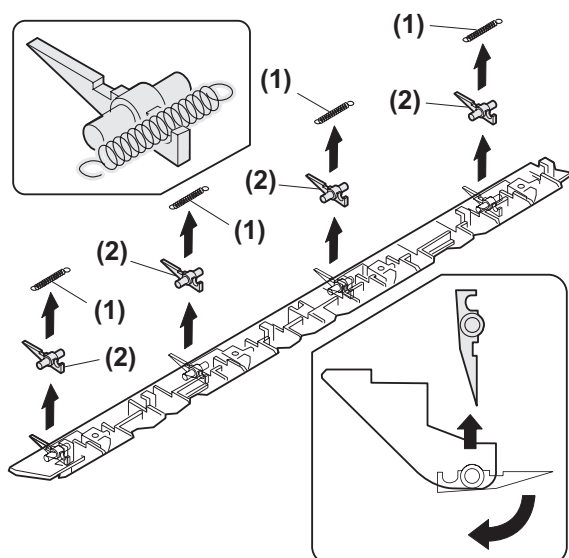


Assembly: Put the fusing harness (A) on the heater lamp (B) as shown in the figure and fix them together. Place the fusing harness inside the rib (C).

E. Upper heat roller

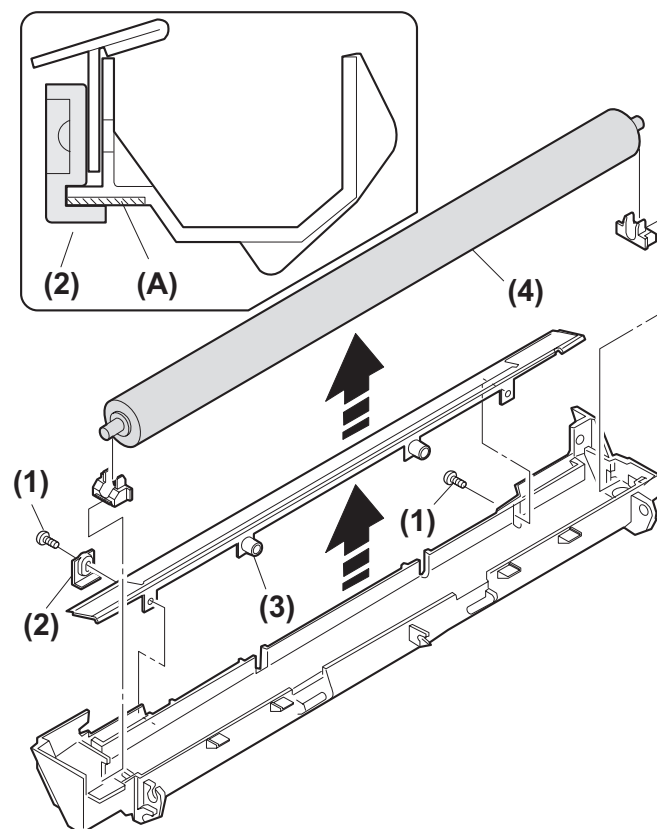


F. Separation pawl



G. Lower heat roller

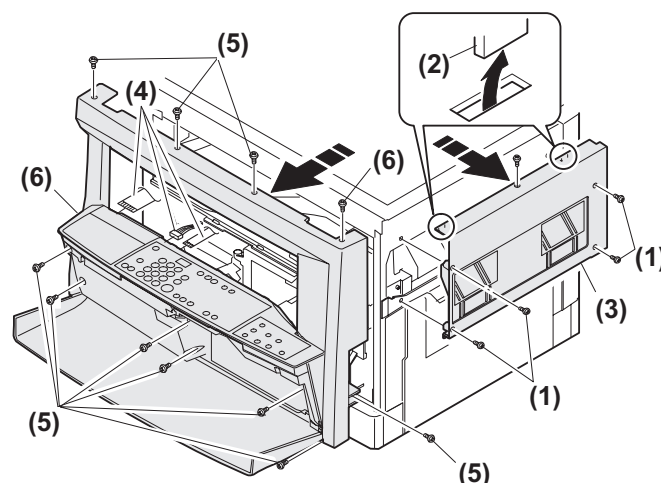
Assembly: When installing the paper guide (3) before fusing, tighten the paper guide fixing plate so that the paper guide fixing plate (2) is in contact with the frame bottom section (A) under fusing.



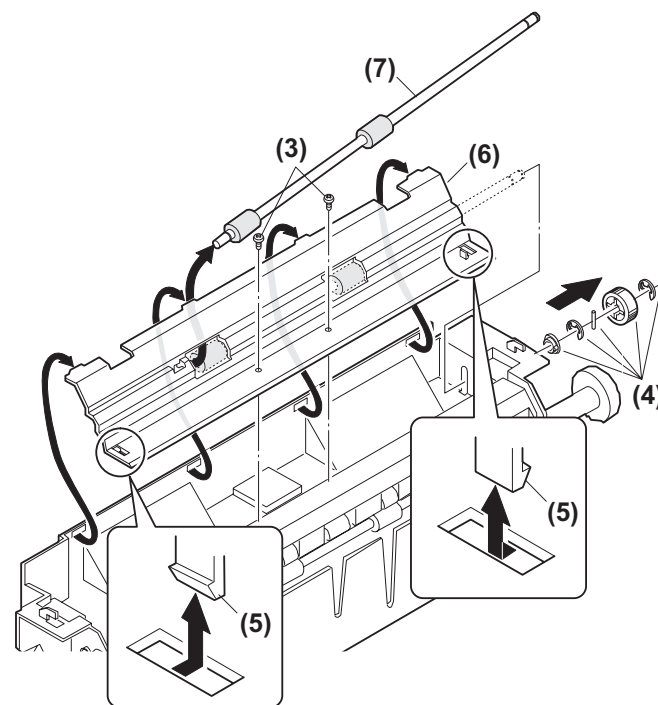
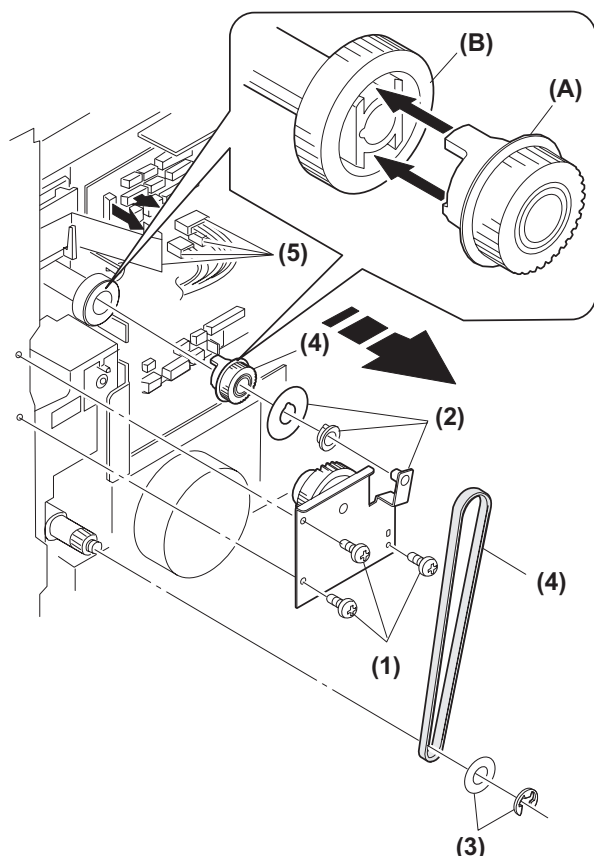
4. Paper exit section

No.	Content
A	Front cabinet unit/Right cabinet unit
B	Paper exit unit
C	Transport roller
D	Paper exit roller

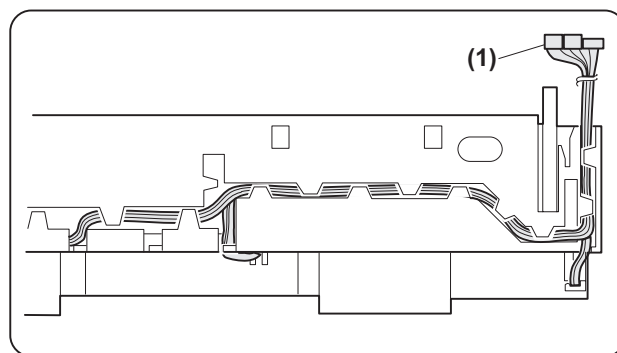
A. Front cabinet unit, right cabinet



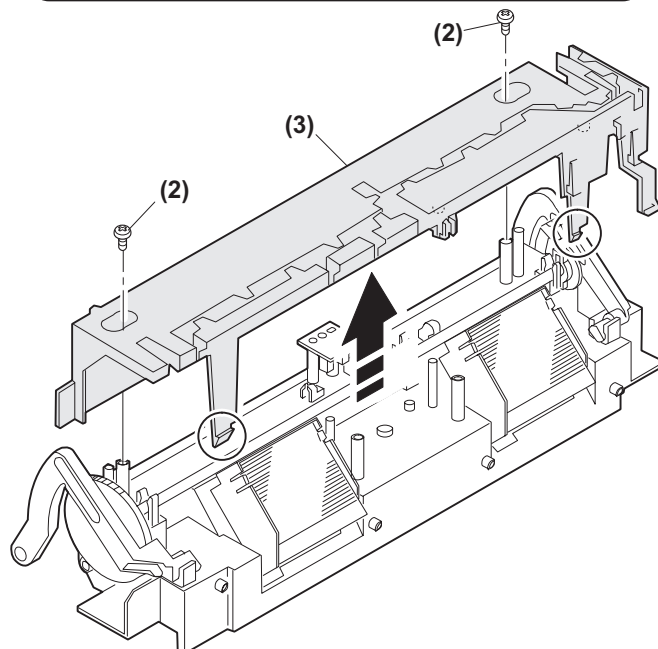
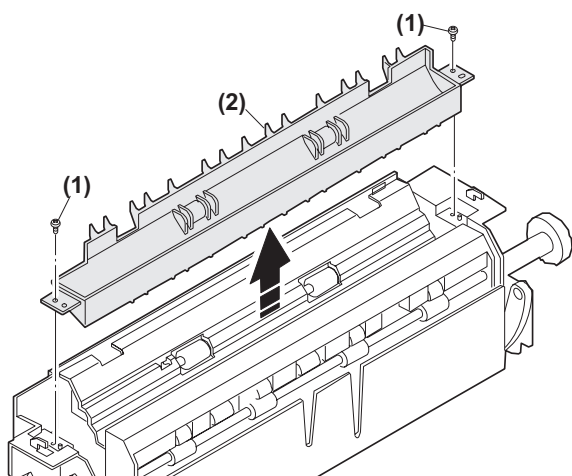
B. Paper exit unit removal



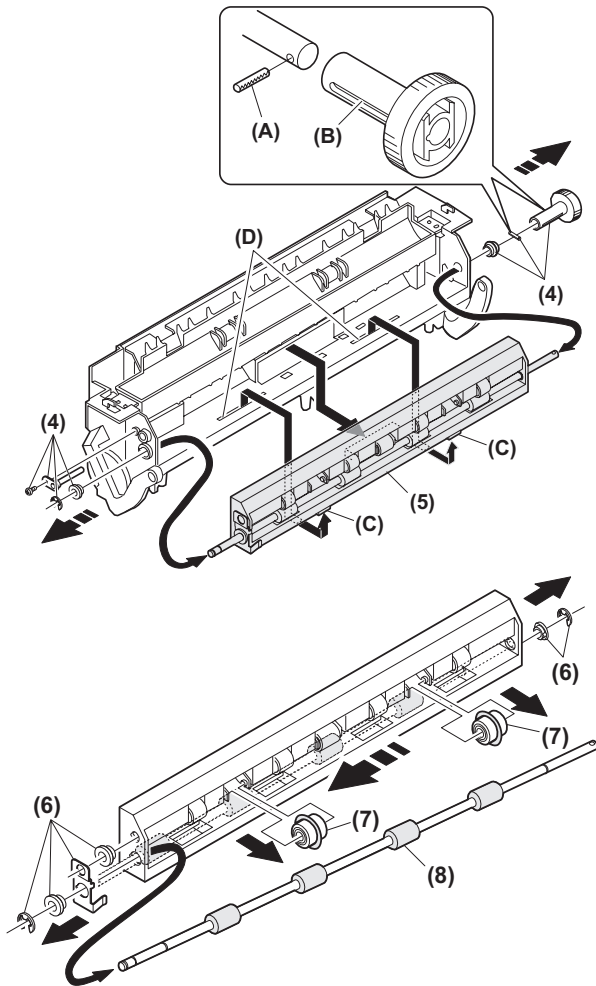
D. Paper exit roller



C. Transport roller



Assembly: Insert the spring pin so that the waveform (A) of the spring pin faces in the longitudinal direction of the paper exit drive gear long hole (B).
Be sure to insert two ribs (C) into the groove (D).

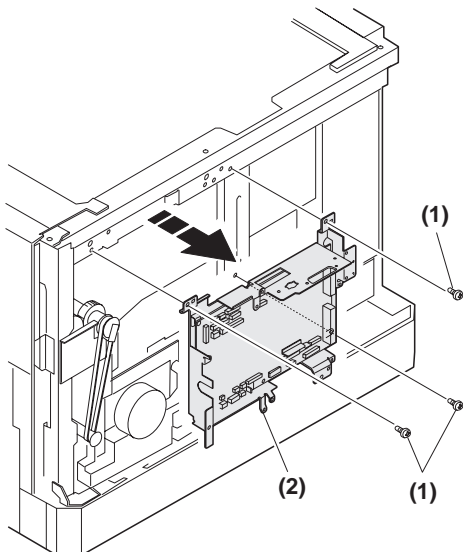


5. MCU

No.	Content
A	MCU

A. MCU disassembly

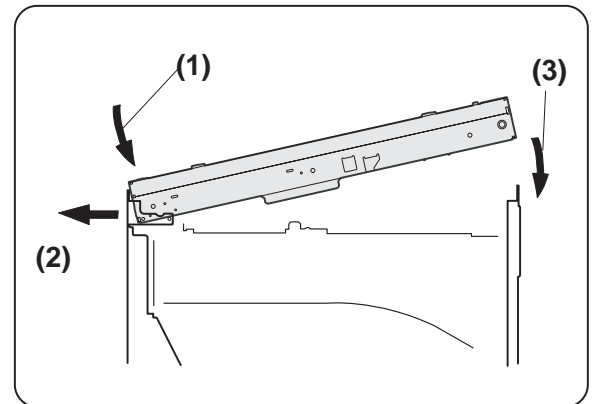
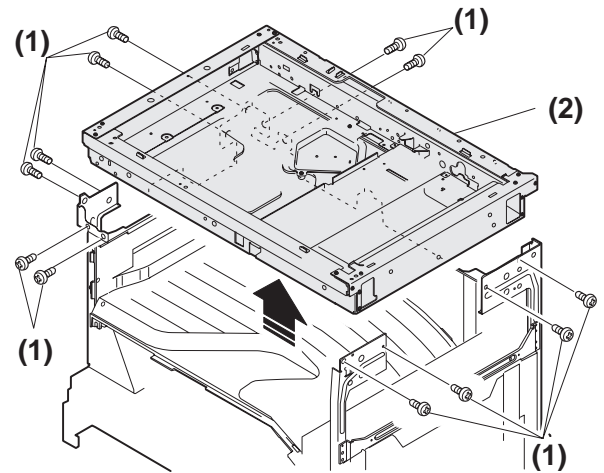
Note: When replacing the MCU PWB, be sure to replace the EEPROM of the MCU PWB to be replaced.



6. Optical frame unit

No.	Content
A	Optical frame unit

A. Optical frame unit

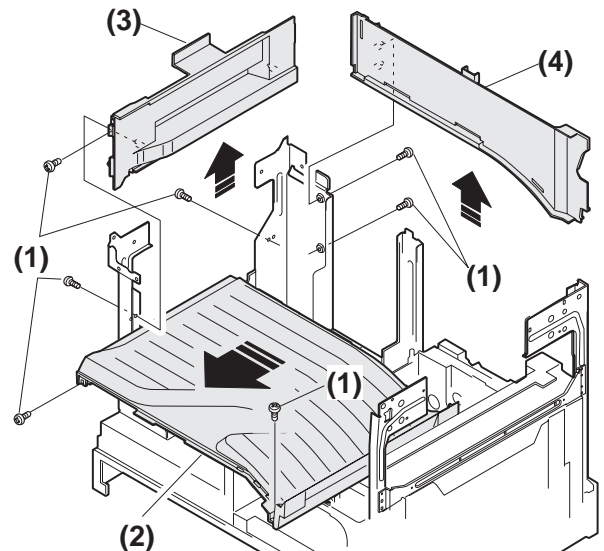


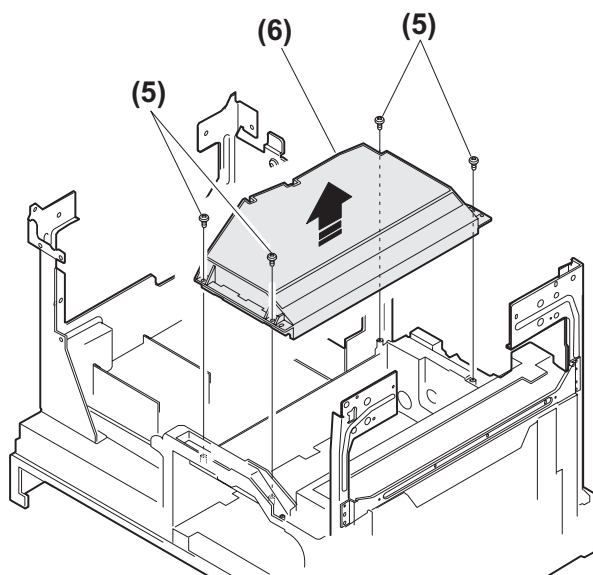
Installation: Install the optical unit in the sequence shown above.

7. LSU

No.	Content
A	LSU unit

A. LSU unit





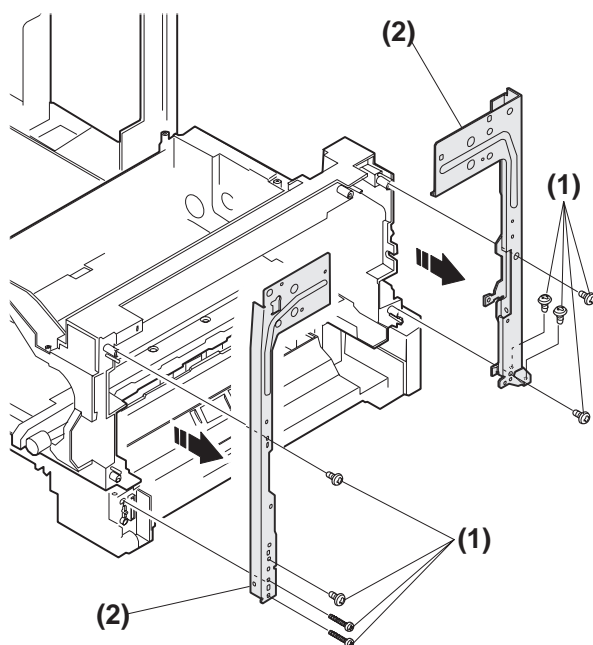
Adjustment:

- Image lead edge position adjustment
- Image left edge position adjustment
- Paper off-center adjustment

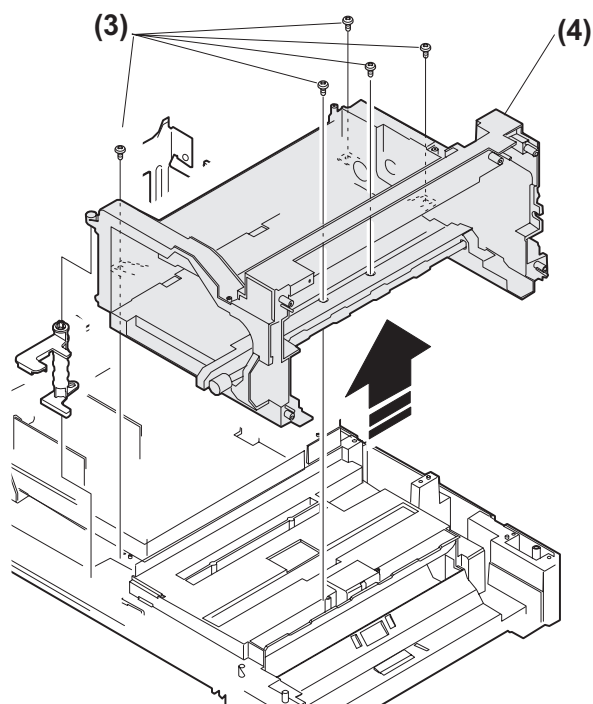
8. Tray paper feed section/Paper transport section

No.	Content
A	Interface frame unit
B	Drive unit
C	Solenoid (paper feed solenoid, resist roller solenoid)
D	Resist roller clutch , Resist roller
E	Paper feed clutch/Paper feed roller (Semi-circular roller)

A. Intermittent frame unit

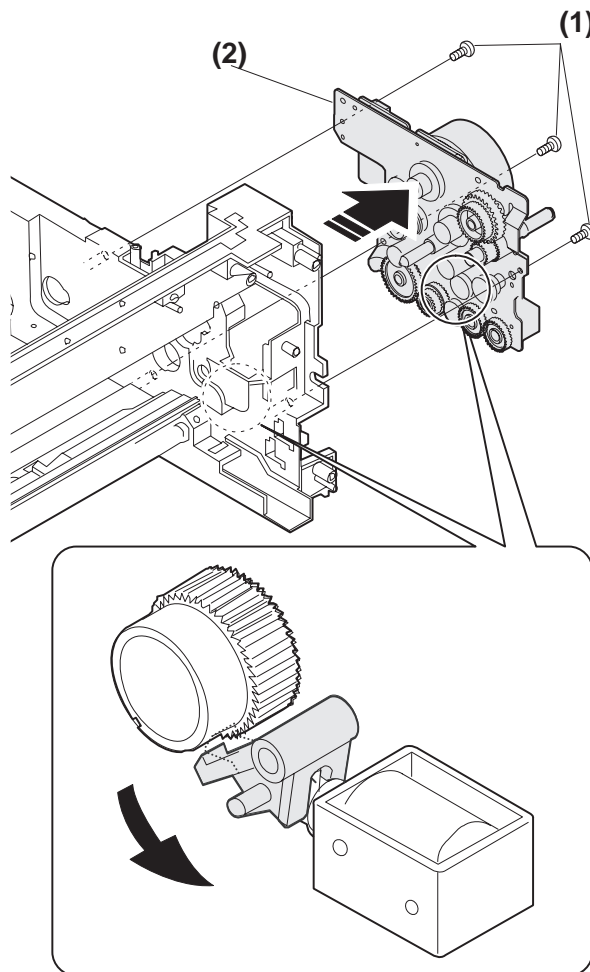


Assembly: Do not miss the door lock pawl.

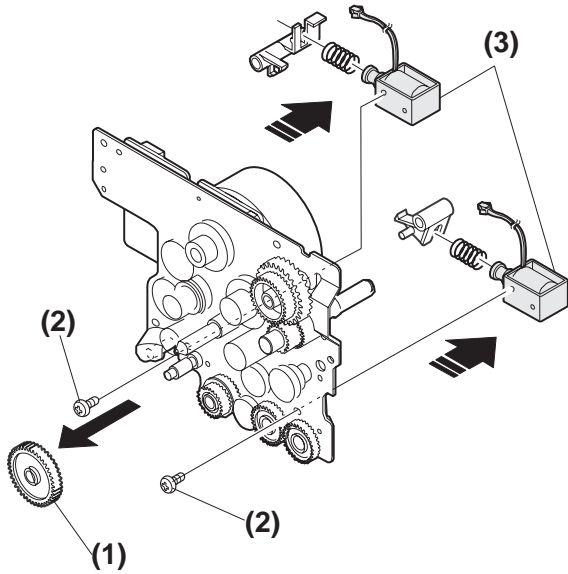


B. Drive unit

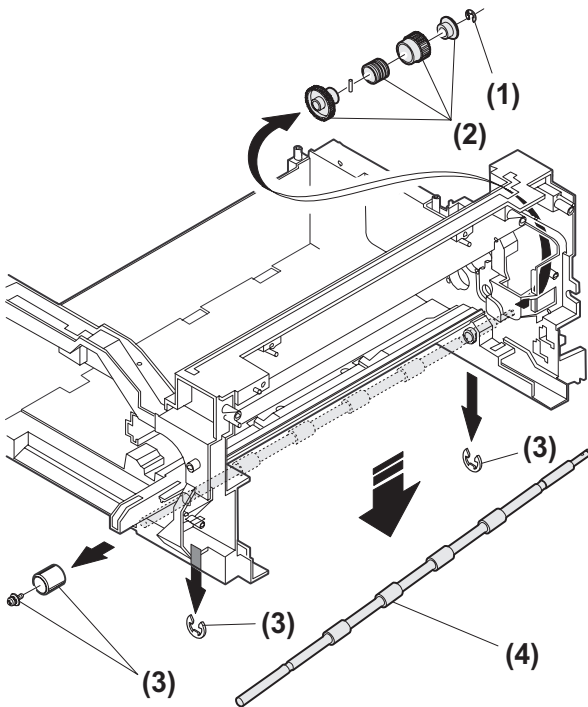
Assembly: Move down the clutch pawl as shown below, and avoid the clutch and install.



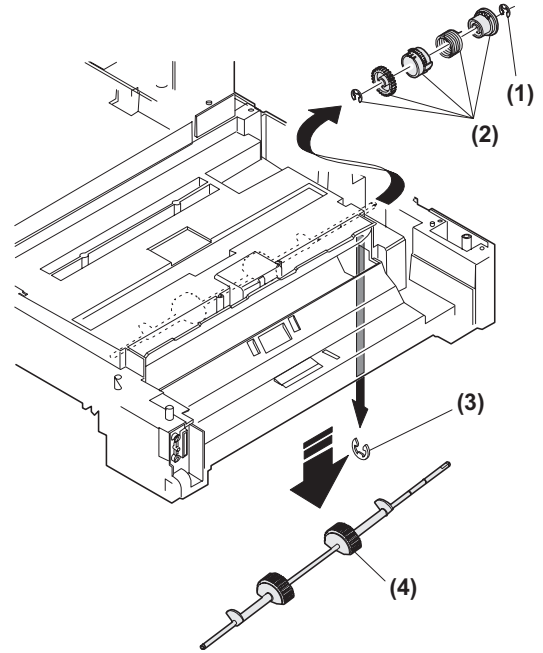
C. Solenoid (paper feed solenoid, resist roller solenoid)



D. Resist roller clutch/Resist roller



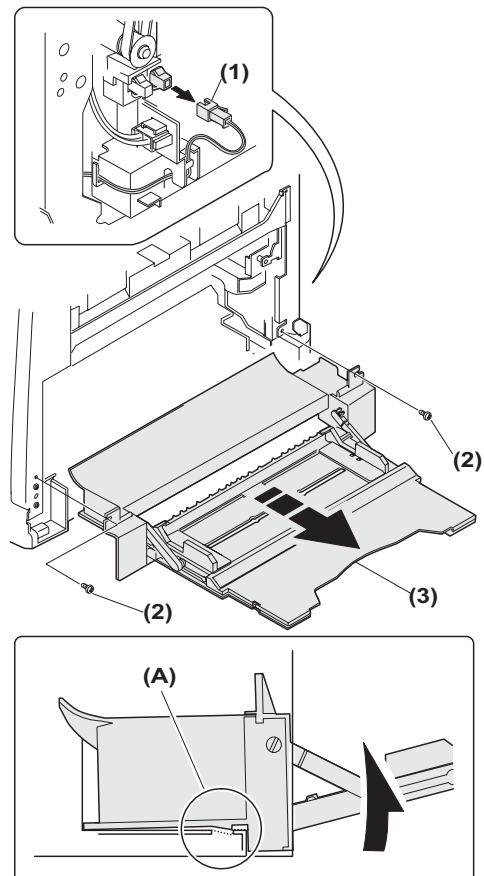
E. Paper feed clutch/Paper feed roller (Semi-circular roller)



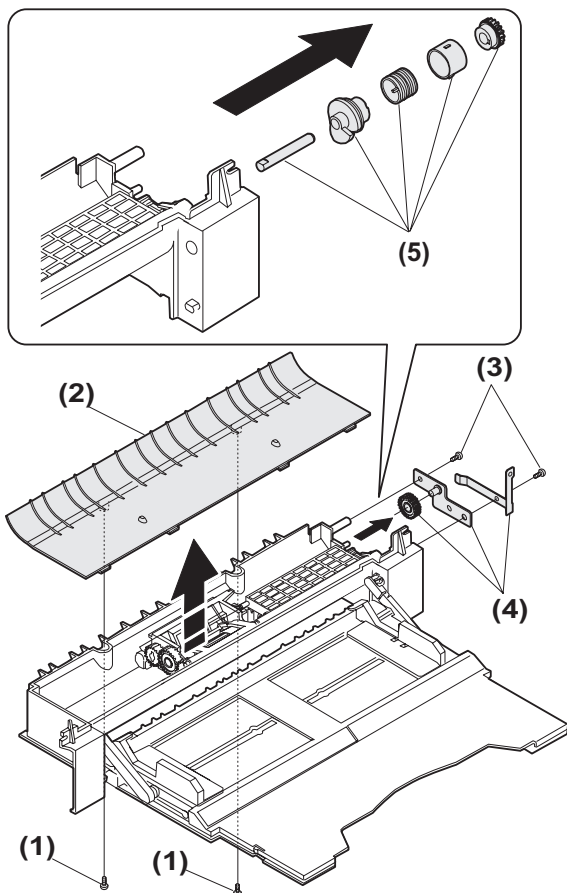
9. Manual multi paper feed section

No.	Content
A	Manual multi paper feed section
B	Manual transport clutch
C	Manual paper feed clutch
D	Manual transport roller/Manual paper feed roller
E	Multi feed solenoid

A. Manual multi paper feed

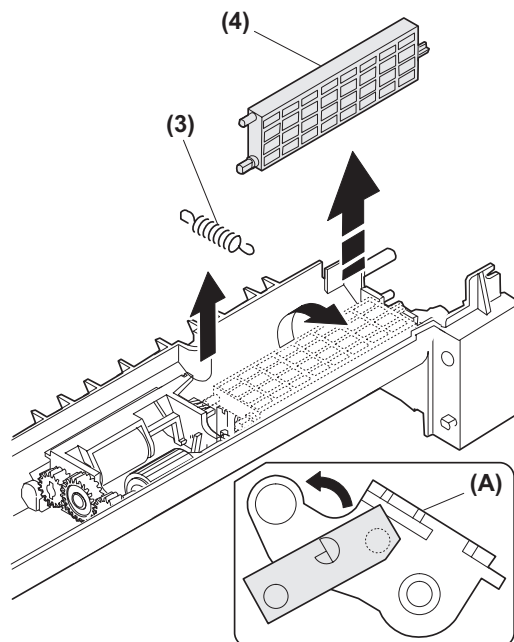


B. Manual transport clutch



Disassembly: Set up the cam transmission arm (2), and remove it.

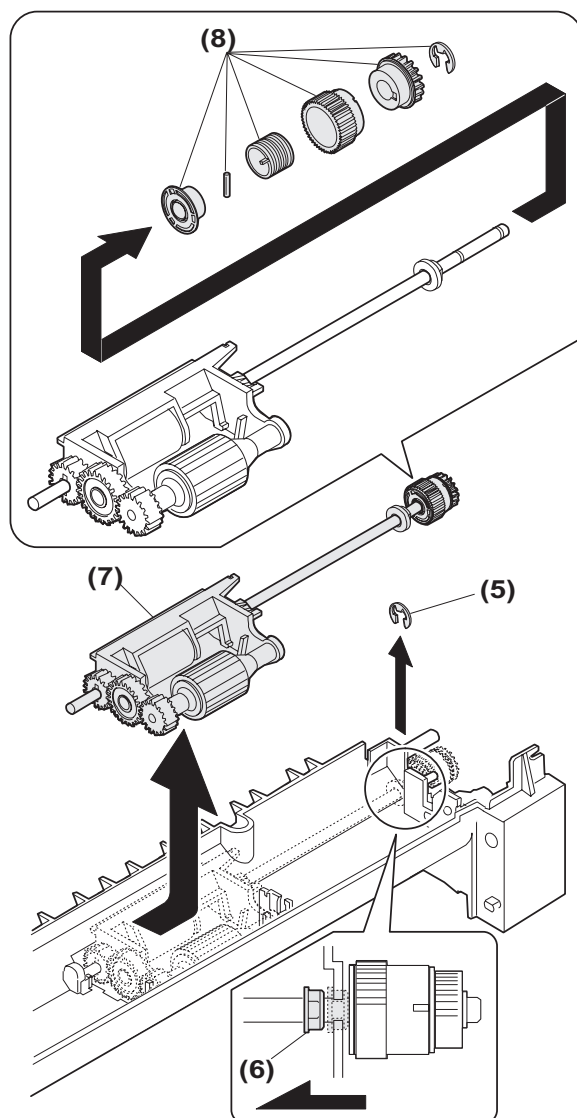
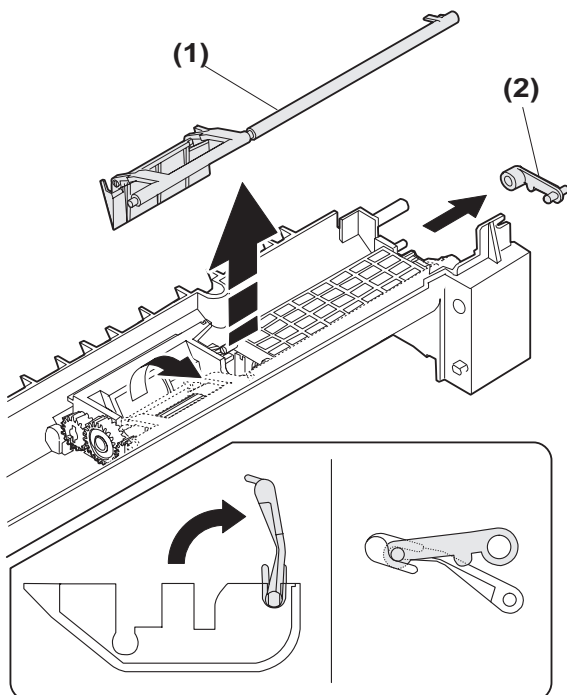
Assembly: Install so that the cam transmission arm (2) is under the roller arm (A).



C. Manual paper feed clutch

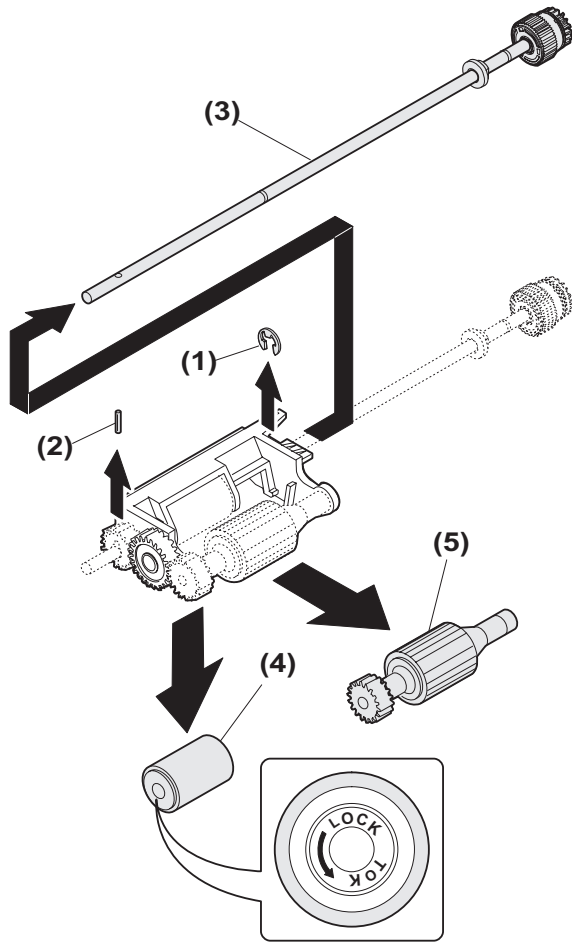
Disassembly: Set up the shutter arm (1) then remove it.

Assembly: Install so that the boss section of the fulcrum arm (2) comes between ribs.



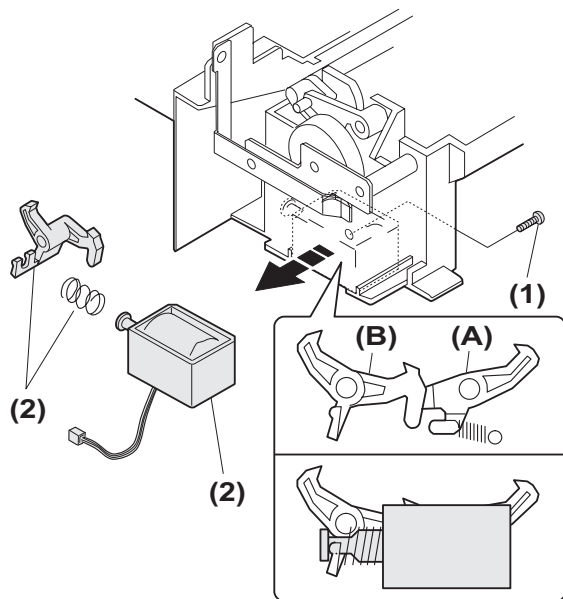
D. Manual transport roller/Manual paper feed roller

Installation: Be careful of the installing direction of the manual transport roller (4).



E. Multi feed solenoid

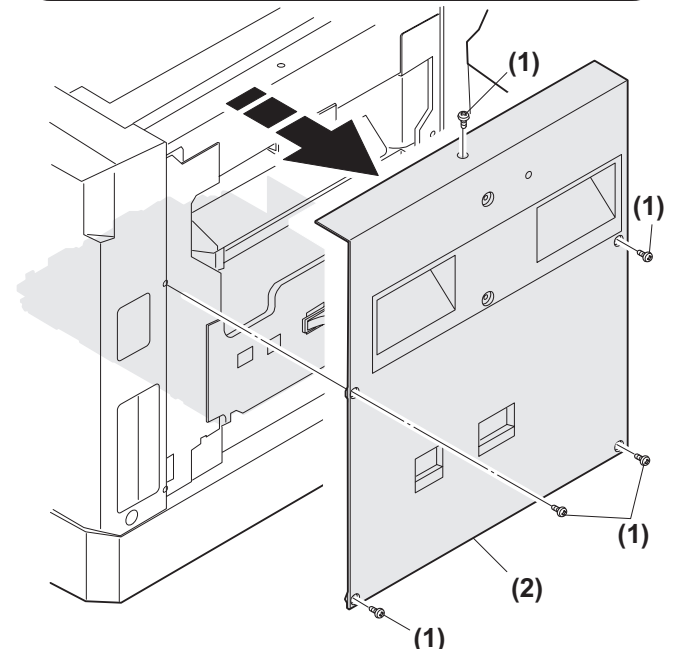
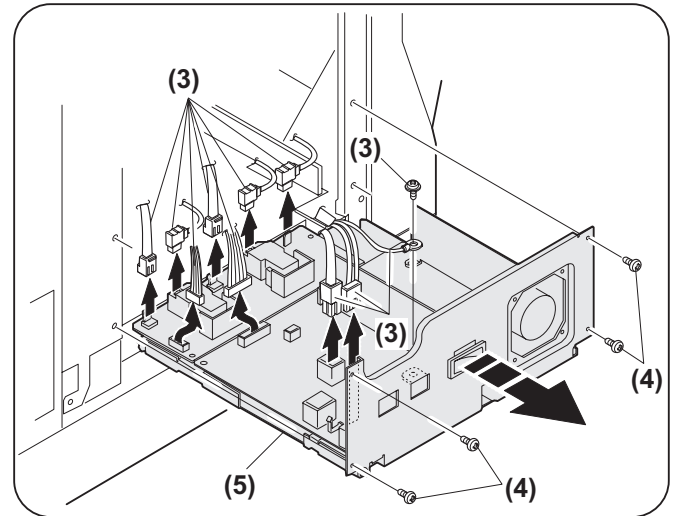
Assembly: Install so that the latches (A) and (B) move smoothly.



10. Power section

No.	Content
A	Power unit

A. Power unit



SHARP

COPYRIGHT © 1999 BY SHARP CORPORATION

All rights reserved.

Printed in Japan.

No part of this publication may be reproduced,
stored in a retrieval system, or transmitted,
in any form or by any means,
electronic, mechanical, photocopying, recording, or otherwise,
without prior written permission of the publisher.

SHARP CORPORATION
Printing & Reprographic Systems Group
Quality & Reliability Control Center
Yamatokoriyama, Nara 639-1186, Japan

1999 January Printed in Japan ®